



## OWNER'S HANDBOOK

250 c. c. MODEL 559/04

350 c. c. MODEL 360/00



# MOTORCYCLE



250 c. c. Model 559/04

350 c. c. Model 360/00

## OWNER'S HANDBOOK

Manufacturers: JAWA n. p., Týnec n/Sázavou

Exporters: MOTOKOV - Praha

Edition 1967



Dear Friend!

We highly appreciate the confidence which you have shown by choosing a motorcycle of our brand. We welcome you to the great world family of Jawa motorcycle enthusiasts which is growing from year to year and now has hundreds of thousands of members. Today there is not one country in the world without Jawa motorcycles serving their satisfied owners.

Because of their reliability and simple servicing as well as maintenance Jawa motorcycles have gained permanent popularity among customers. Jawa motorcycles are always among the best in international trials, moto-cross or road racing contests. Thorough research and development, tradition in motorcycle production as well as long-standing experience in designing and the production of successful sport machines - are all factors which have enabled us to offer you an outstanding product of world standard.

We recommend you to acquire a good knowledge of the contents of this manual. You will become acquainted with your motorcycle and learn about its parts and their function.

We hope you will get much pleasure and enjoyment from your Jawa motorcycle.



The monthly Czechoslovak Motor Review which is issued in English, Russian, German, French and Spanish versions, informs its readers on topics concerning the design, operation and maintenance of Czechoslovak motor cycles. You are invited to become its regular subscribers. Mail your applications to the Czechoslovak Motor Review, 28. října 13, Praha 1, Czechoslovakia.



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# I. SPECIFICATION AND OPERATOR'S MANUAL

1. TECHNICAL DATA	250 c. c. Model 559/04	350 c. c. Model 360/00
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Engine . . . . .	two-stroke, air-cooled	
Number of cylinders . . . . .	one	two
Bore . . . . .	65 mm	58 mm
Stroke . . . . .	75 mm	65 mm
Cylinder capacity . . . . .	248.8 c. c.	344 c. c.
Compression ratio . . . . .	7.7 to 1	8 to 1
Maximum engine output . . . . .	14 BHP/5.500 r.p.m.	18 BHP/5.500 r.p.m.
Fuel consumption at steady 37 m. p. h. (60 km p. h.) . . . . .	3.2 litres/100 km	3.5 litres/100 km
Fuel tank capacity . . . . .	3 galls (13.5 litres)	
Maximum speed (driver crouching) . . . . .	65—68 m. p. h.	72—74 m. p. h.
Maximum climbing ability (fully laden) . . . . .	39 %	40 %
Dimensions of motorcycle - length . . . . .		1,980 mm
height . . . . .		1,025 mm
width . . . . .		650 mm
Weight of motorcycle - dry . . . . .	282 lbs (128 kg)	305 lbs (139 kg)
incl. fuel . . . . .	308 lbs (140 kg)	330 lbs (150 kg)
Carrying capacity (payload) . . . . .	353 lbs (160 kg)	
Front wheel spindle max. load . . . . .	220 lbs (100 kg)	231 lbs (105 kg)
Rear wheel spindle max. load . . . . .	440 lbs (200 kg)	451 lbs (205 kg)
Primary drive by 3/8 x 3/8 in chain . . . . .	60 links	64 links
Secondary drive by 1/2 x 5/16 in chain . . . . .	120 links	118 links
Drive ratios - primary . . . . .	45/22 T	45/27 T
- secondary . . . . .	46/18 T	46/17 T
- bottom gear . . . . .		19/12 x 24/12 T 3.07
- second gear . . . . .		19/12 x 20/16 T 1.58
- third gear . . . . .		19/12 x 17/19 T 1.42
- top gear . . . . .		1/1 direct 1.00
Overall gear ratios: - bottom gear . . . . .	16.5 to 1	14.3 to 1
- second gear . . . . .	10.3 to 1	8.9 to 1
- third gear . . . . .	7.4 to 1	6.4 to 1
- top gear . . . . .	5.2 to 1	4.5 to 1
Overall kickstarter ratio . . . . .	3.41	2.78
Speedometer drive ratio . . . . .	5/11 T	5/12 T
Internal expanding brakes . . . . .	dia 160/35 mm	
Braking distances from 25 m. p. h. (40 km p. h.) . . . . .		59.04 ft. (18 m)
- front wheel brake . . . . .		49.20 ft. (15 m)
- rear wheel brake . . . . .		36.08 ft. (11 m)
- both brakes applied . . . . .		

Fig. 1 - Jawa 250 c. c., Model 559/04



Front mark maximum stroke  
 Pivoted rear fork maximum  
 stroke . . . . .  
 Carburetter . . . . .  
 Wheels - size of rims . . . .  
   - size of front tyre . . .  
   - size of rear tyre . . .

5 1/3 in. (130 mm)  
 3 15/16 in. (100 mm)  
 JIKOV 2926 SD 11b JIKOV 2926 SBD 17b  
 1.85 B x 16 in.  
 3.25 x 16 in.  
 3.50 x 16 in.

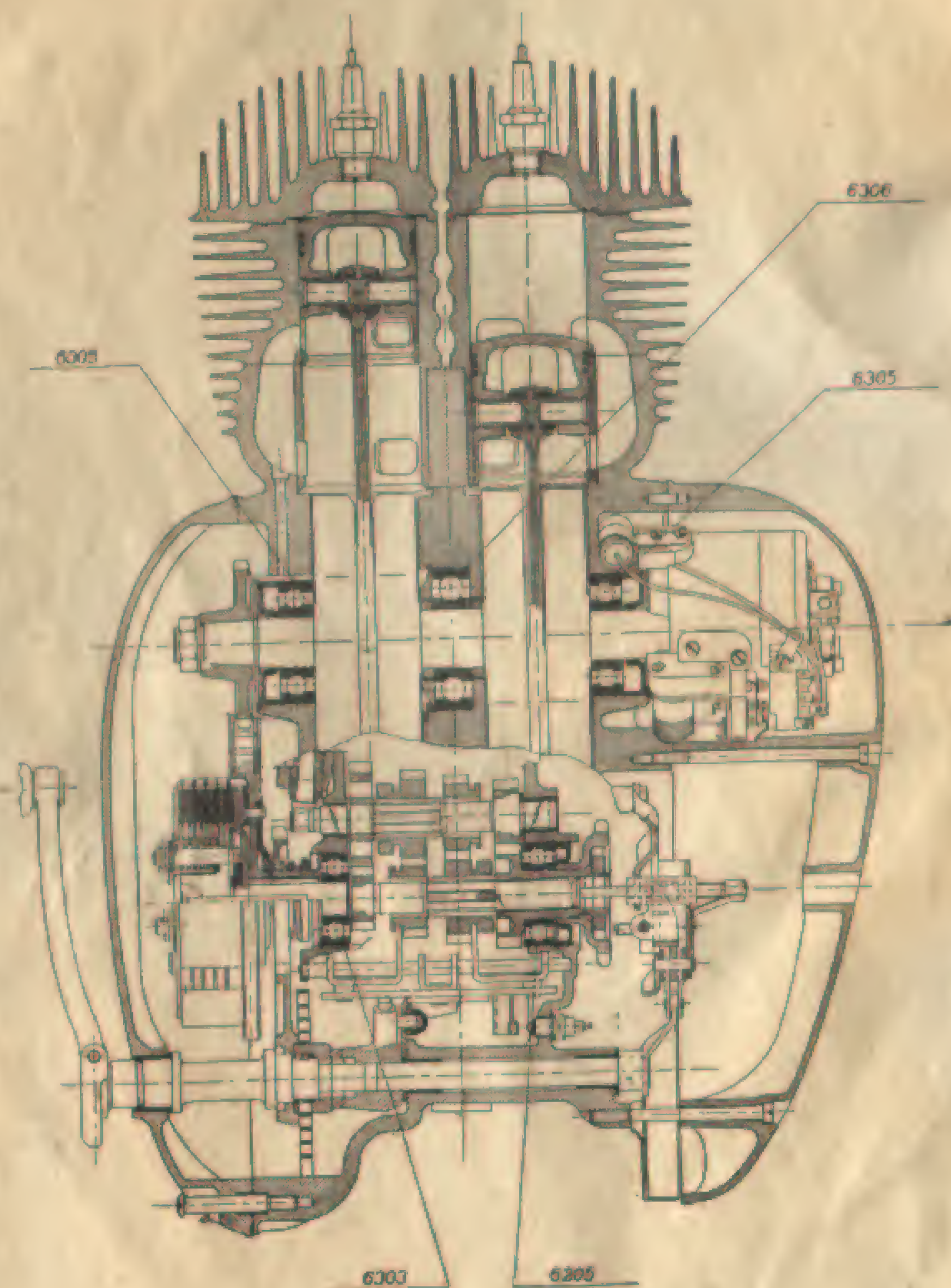


Fig. 2 - 350 c. c. - sectional view

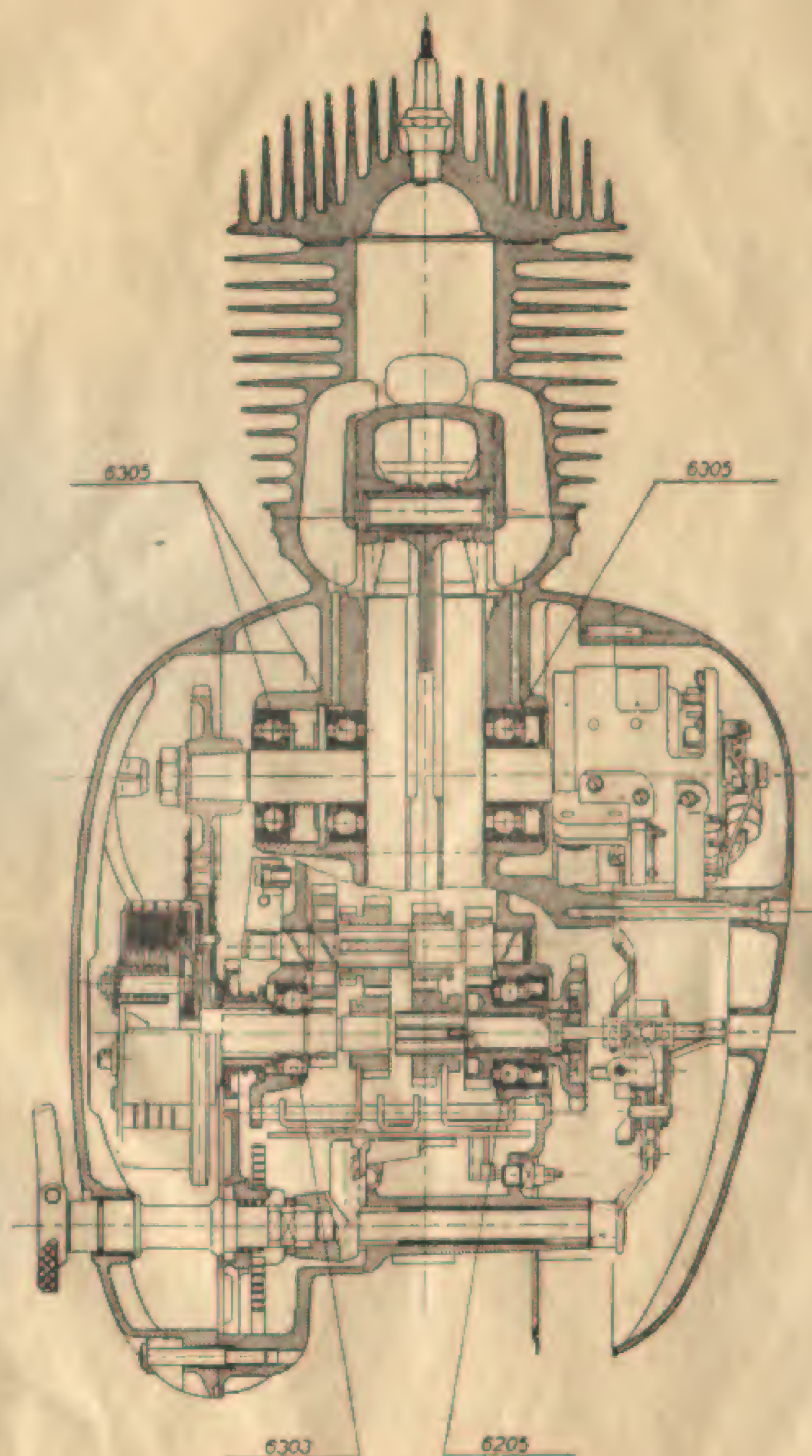


Fig. 3 - 250 c. c. - sectional view



## 2. DESCRIPTION OF MOTORCYCLE

The 250 c. c. - Model 559/04 and 350 c. c. - Model 360/00 are solo motorcycles suitable for carrying one or two persons.

**The power unit** is an air-cooled, two-stroke petrol engine with inverted scavenging. The engine has a quiet run, well balanced within its extent of revolutions and is capable of lively acceleration.

**The clutch** is of the five-plate friction type, with steel plates and cork lined plates running in an oil bath. Clutch control by hand lever is fitted on L. H. side of the handlebars.

**The gearbox** is of the four-speed type, forming with the crankcase a monobloc engine unit duly vented.

**The gear shifting** is foot operated by means of a lever located on the L. H. side of the engine. The gear change mechanism is fitted with an electric tell-tale bulb indicating the neutral position. When changing gear, the declutching is automatic.

**The starting of the engine** is foot operated by means of the same lever as gear shifting by rotating the lever to the starting position. As soon as the engine starts running, the lever returns automatically into its horizontal position.

The primary and secondary transmission is by means of **chains**. The primary chain ( $1 \times 9.525 \times 9.525 - 3/8 \times 3/8$ ") is enclosed by the L. H. crankcase cover and runs in an oil bath. The secondary chain ( $1 \times 12.7 \times 7.75 - 1/2 \times 5/16$ ") is fully enclosed and thus its life is prolonged.

**The carburetter** is protected by the carburetter cover, the design of which contributes to the well-known attractive appearance of the Jawa engines. Motorcycles 250 c. c. Model 559/04 are provided with the carburetter JIKOV 2926 SD 11b with the choke, controlled by means of the ring with the finger stop on the handlebars at the twist grip. Motorcycles Jawa 350 c. c. Model 360/00 are equipped with the carburetter JIKOV 2926 SBD 17b with a butterfly air valve. To the carburetter is attached the induction silencer and air cleaner, accessible after removing the dual seat.

**The spoke wheels** are easily detachable - both front and rear spindles being of the push-out type. The rear wheel is connected with the rear chainwheel by means of a rubber blocks. The number of spokes is 36 in each wheel, spokes dia 3.5 mm, thread M 4.

**The full width hub rear brake** is right-foot controlled by means of a pedal and cable, **the full width hub front brake** is right-hand controlled by means of a lever on the R. H. side of the handlebars. Both of the brakes are very efficient and can be adjusted without tools.

**The frame** is built up of square section welded tubes with a pivoted rear fork.

**The fuel tank** is a sheet steel pressing. It is fitted with a filler cap dia 60 mm (2.36 in.) and a fuel tap with filter. It has an emergency fuel reserve for approx. 12—19 miles (20—30 km).





Fig. 4 - Opening the boxes

The dual seat with foam-rubber padding is very comfortable. Together with the rear suspension it offers a superior ride to both driver and passenger. The dual seat, locked by means of the safety lock, is detachable and covers the induction silencer and a compartment for tyre inflator and spare parts.

After unlocking the dual seat and removing it, both spring-latches of the box covers are accessible and the covers can be opened by pressing the thumbs on the spring-latches (Fig. 4).

The footrests are of the sports type and adjustable.

The handlebars of 22 mm (0.86 in.) outer diameter have a width of 650 mm (25.7 in.). They are of one piece.

The front wheel suspension is provided by a telescopic fork with oil dampers. The suspension elements are fully covered. The damping force curve of the dampers is very favourable, the fork being sensitive enough to absorb small surface unevenness while damping more efficiently also big shocks.

Breathing of the fork is not effected by special breather valves as before, but by holes in the stanchion tube nuts (2). On motorcycles packed in crates or in cases at the Works these holes are closed by rubber plugs (1) to prevent the oil escaping and consequently the plugs must be removed before putting the motorcycle into operation!

To remove the plugs proceed as follows: Tear off the protruding portion of the rubber plug upwards so that the remainder of the plug will drop inside the fork and be caught on the screens. Make sure that the breathing hole is free after removal of the plug, for example, with a piece of wire.

The rear wheel suspension is provided by the pivoted fork and fitted with two hydraulic dampers. Spring units of the dampers are protected by steel covers.

Besides the lock in the switch box, the motorcycle can be provided with a padlock to be located in the opening on the L. H. side of the frame head and in the steering lug.

#### Note.

No spare ignition and saddle-lock keys are supplied by the works! Therefore take good care of the spare set of keys and should you lose one, have a new one made to the pattern of the spare key.

### 3. DESCRIPTION OF ELECTRICAL EQUIPMENT

Ignition is effected by dynamo and battery. The dynamo is of the six-pole D. C. type, JAWA 45 W, 6 V.

The dynamo stator is secured by two M6 studs to the crankcase. On the dynamo is fitted the contact breaker, which can be rotated through 16 deg. (for ignition timing), the voltage regulator, the terminal base, brushes, condenser and the resistance coil.

The dynamo rotor is fitted to the crankshaft and fixed by a bolt together with the cam controlling the contact breaker.

The voltage regulator with an automatic switch is an appliance which keeps the voltage constant and switches the dynamo current to the battery current. Inexpert manipulation with the regulator must be avoided and the manufacturers do not guarantee either dynamos or regulators on which the regulator contacts have been tampered with. Any major repairs should be carried out by a specialized repair shop equipped with special apparatus.

The 14 Ah, 6 V battery with lead plates and electrolyte is located in the L. H. side box and connected to the frame with its plus pole (+). A 15 Amp. fuse is fitted in a case next to the battery.

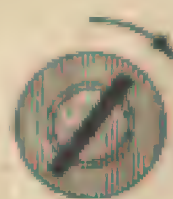
The switch box is built into the headlamp and distributes the dynamo or battery current to the electric accessories. The switch box is equipped with a safety lock. In the top headlamp nacelle (in the speedometer) two tell tale 6 V - 1.5 W bulbs are located. The light of the yellow bulb (on R. H. side) indicates neutral engaged between bottom and second gear. The light of the red bulb (on L. H. side) appears when the ignition is switched on and goes off as soon as the dynamo begins to supply current to the battery.



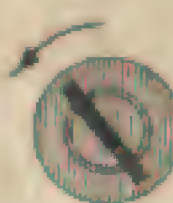
### The switch key positions:



all appliances off, the lock of the dip switch released.

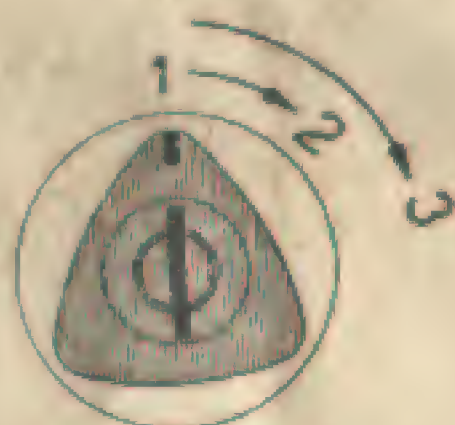


the ignition is switched on.



use this position, if the battery is out of order or taken out. Engage the second gear and push the motorcycle. (As soon as revolutions reach the necessary r. p. m., the voltage regulator switch switches on and supplies current to the ignition coil.)

### The light switch positions:



1 light off

2 parking (pilot) and tail light on

3 headlamp, parking and tail light on

The light switch can only be operated when the ignition key is inserted. The ignition key can be withdrawn in all light switch positions (e. g. for parking in night, insert the ignition key, switch the light switch to the correct position and pull out the ignition key).

**Note:** The electric horn and stop light are, in accordance with the traffic regulations, always connected and cannot be switched off by means of the ignition key.

**The stop switch** is fitted in the R. H. side tool box.

The connections are by varnish coated leads. The lead terminals are brass or soldered. The leads - dynamo to switch box, switch box to dip switch, dip switch to main bulb, battery and sparking plug leads are 1.5 sq. mm (0.0023 sq. in.) in section, the remaining leads 1 sq. mm (0.0015 sq. in.).



Fig. 5 - Stop switch

### Electrical accessories:

The headlamp is fitted with a 6 V, 25/25 W double filament bulb.

**Parking bulb:** 6 V, 1.5 W.

**Tail bulb:** 6 V, 5 W, **stop bulb:** 6 V, 15 W.

**The ignition coils** - Jawa made - are fitted to the frame underneath the fuel tank.

**The electric horn** is fed from the battery when the motorcycle is at a standstill and is operated by means of the push-button on the dip switch located on the handlebars.

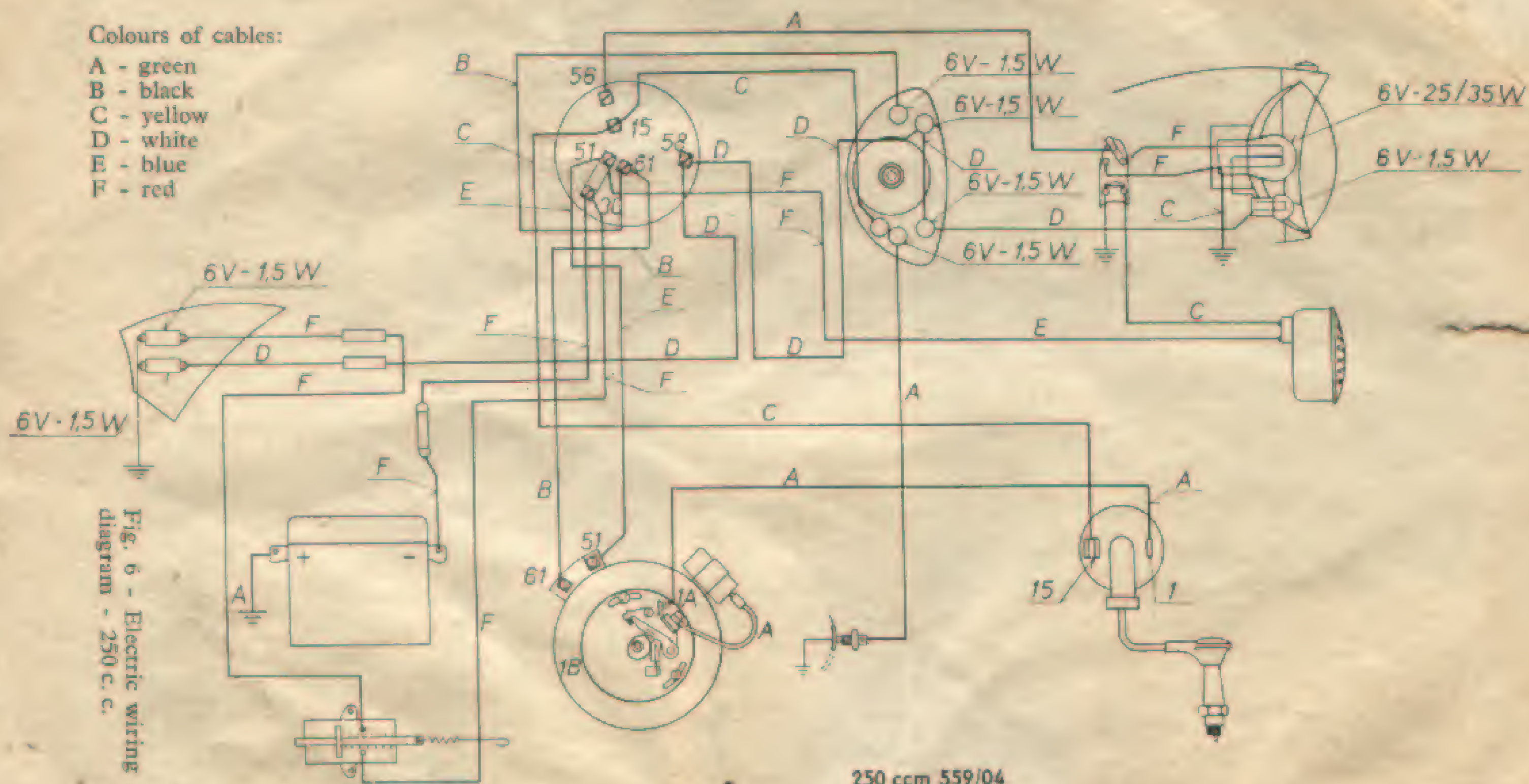
**Sparking plugs:** Both models 250 c. c. and 350 c. c. are provided with the **interference suppressing sparking plugs PAL 14-8 RZ**. With these sparking plugs, the plug terminals without any interference suppressing core are assembled.

**Note:** Should sparking plugs without interference suppressing cores be used, it is necessary to assemble **plug terminals with interference suppressing cores**.



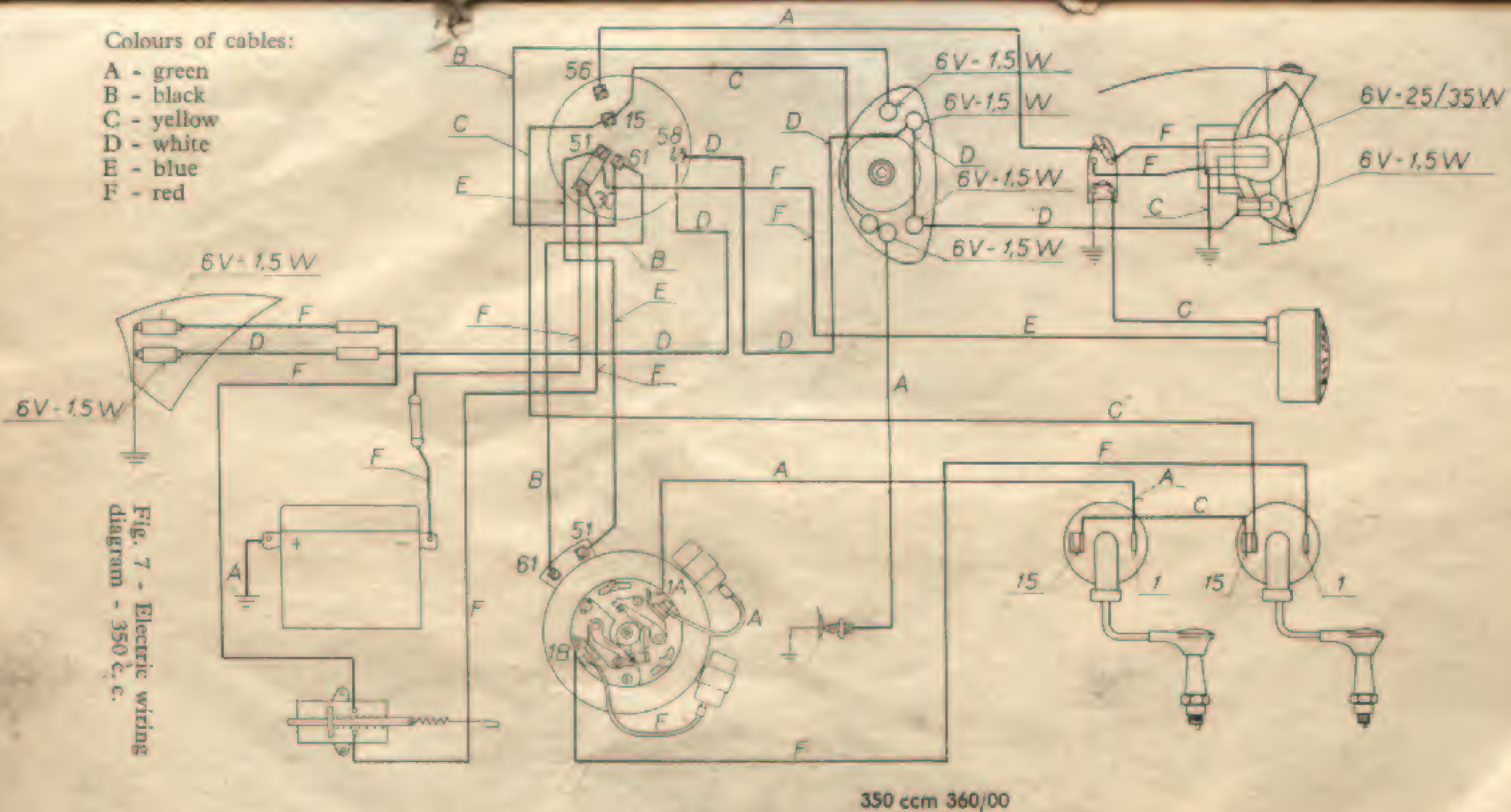
Colours of cables:

- A - green
- B - black
- C - yellow
- D - white
- E - blue
- F - red



Colours of cables:

- A - green
- B - black
- C - yellow
- D - white
- E - blue
- F - red





## 4. LIST OF TOOLS

Tool kit	Special hook spanner 19 mm
Cleaning cloth	Combination pliers
Screwdriver (3 mm)	Box spanner 10 mm
Contact breaker feeler gauge	Box spanner 14 mm
Handle for box spanners	Box spanner 17 mm
Combined spanner	Double-ended spanner 5.5/7 mm
Tyre lever with hook spanner	Double-ended spanner 9/10 mm
- 1 piece	Double-ended spanner 11/12 mm
Tyre lever - 1 piece	Double-ended spanner 14/17 mm
Double screwdriver	Tyre inflator complete

## 5. RUNNING IN A NEW MOTORCYCLE

When taking over a new machine, the customer is advised to check the equipment of the motorcycle as well as the oil level in the gearbox and in both front and rear suspension dampers. The oil level in the gearbox can be checked through the oil level inspection hole closed by the screw M6 x 8. For filling up with oil see Part II, para 2 "Lubricating the Motorcycle". To check the correct oil level in the hydraulic suspension dampers, depress the front and rear of the motorcycle in turn as much as possible, release quickly and check the recoil for smooth, bounceless movement. Or ride for a short distance on a rough road and check the front and rear suspension respectively for rattling, bouncing, knocking and noise. It should be pointed out that the riding comfort on this type of motorcycle depends above all on the proper operation of the hydraulic dampers. A new motorcycle just as a new motor car requires careful running in, if the engine is to attain a long life. Only with such running in is it possible to harmonize the contact faces of all the moving parts smoothly so as to avoid overheating of the friction faces and possible damage to them. It is thus clear that the basic condition of good running in is not to use high engine power for a given time, i. e. to keep the speed down according to the table below and to observe the following instructions:

- mix petrol with oil in the approved ratio 25 to 1 (approx. 1/2 pint to 1 1/2 galls),
- before covering 600 miles (1,000 km) do not exceed the following lowest and highest speeds in the individual gears:

	250 c. c.	350 c. c.
Bottom gear . . . . .	0—11 m. p. h. (0—18 km p. h.)	0—12 m. p. h. (0—20 km p. h.)
Second gear . . . . .	9—19 m. p. h. (15—30 km p. h.)	9—22 m. p. h. (15—35 km p. h.)
Third gear . . . . .	16—26 m. p. h. (25—42 km p. h.)	16—31 m. p. h. (25—50 km p. h.)
Top gear . . . . .	25—37 m. p. h. (40—60 km p. h.)	25—44 m. p. h. (40—70 km p. h.)

- From 600 miles (1,000 km) to 1,550 miles (2,500 km) do not exceed the highest speed:

250 c. c.	350 c. c.
53 m. p. h.	56 m. p. h.
(85 km p. h.)	(90 km p. h.)

- Check periodically all screws and nuts for slackness and if necessary tighten them firmly. It is essential to tighten well the engine fixing screws (4 in the front and 2 in the rear part of the engine - the rear screws are accessible after removing the L. H. side box).
- After the first 300 miles (500 km) change the oil in the gearbox. Repeat this operation after 900 miles (1,500 km). See Part II, para 2 "Lubricating the Motorcycle".

### Caution:

Do not ride at the mentioned highest speeds constantly and use them especially at the beginning for a short distance only. It is recommended to open and close the throttle slightly from time to time when riding on highways.

During the running-in period, the carburettors are set for a rather rich mixture. It is, therefore, necessary in the interest of fuel consumption to adjust the needle position and the pilot air screw after the running-in period in accordance with the table mentioned in Part II, para 7 "Carburettor".

Motorcycles JAWA are equipped with the very efficient air-intake and exhaust silencers decreasing the general level of noise of the machine to such an extent that it corresponds to the traffic regulations. The result of that, however, unavoidably leads to more audible and striking common mechanical noises than was noticeable on previous models, when the air-intake and exhaust noise damped the noise of the mechanical movements.

This fact has to be taken into consideration when judging the mechanical noises which on air-cooled combustion engines with higher output cannot be avoided. Besides mechanical noises, the source of which is mostly the movement of the piston in the cylinder (when turning from T. D. C.), there is also the noise of the fuel combustion in the cylinder, which also cannot be eliminated but to a certain degree reduced only. As in these cases, minor mechanical noises are involved and there are no reliable technical measuring apparatus at the disposal, only an experienced motorcycle specialist can judge them and specify their source and level. Noises of this character are entirely harmless and cannot be considered as a defect of the engine. They are only an inevitable accompanying feature of combustion engines with higher specific output and increased air-intake and exhaust silencing.



Attention must be called to the fact that it is not recommended to make any alterations in the air-intake and specifically in the exhaust system as probably the mechanical noises can be decreased but the general level of the noise of the machines increases and deviates from the limit stipulated by the traffic regulations and the driver may be fined by the traffic Police.

## 6. SERVICING INSTRUCTIONS

### A. Before starting

Make sure that there is fuel in the fuel tank. Open the fuel tank filler cap by turning it anticlockwise. Keep the filler cap breathing hole clean. After running in the motorcycle, mix fuel with oil at a ratio 25 to 1 (approx. 1/2 pint to 1 1/2 galls).

The fuel tank is fitted with a lever type fuel tap. This fuel tap ensures an emergency fuel supply for about 20 miles (30 km), dependent on the terrain and speed.

Check the tyre pressure. The pressure in the front tyre should be 18 lbs sq. in. (1.25 atm. g.), in the rear tyre 21 lbs sq. in. (1.5 atm. g.), when riding with a pillion passenger increase the pressure in the rear tyre to 28 lbs sq. in. (2 atm. g.).

### B. Starting the engine

If the motorcycle has not been in use for a considerable period or has been parked outside in the cold weather, the clutch plates may be stuck. It is recommended to test the clutch before starting the engine: Engage the bottom gear, push the motorcycle forwards and backwards and declutch. If there is no resistance in the rear wheel (the clutch does not stick), engage neutral between bottom gear and second gear.

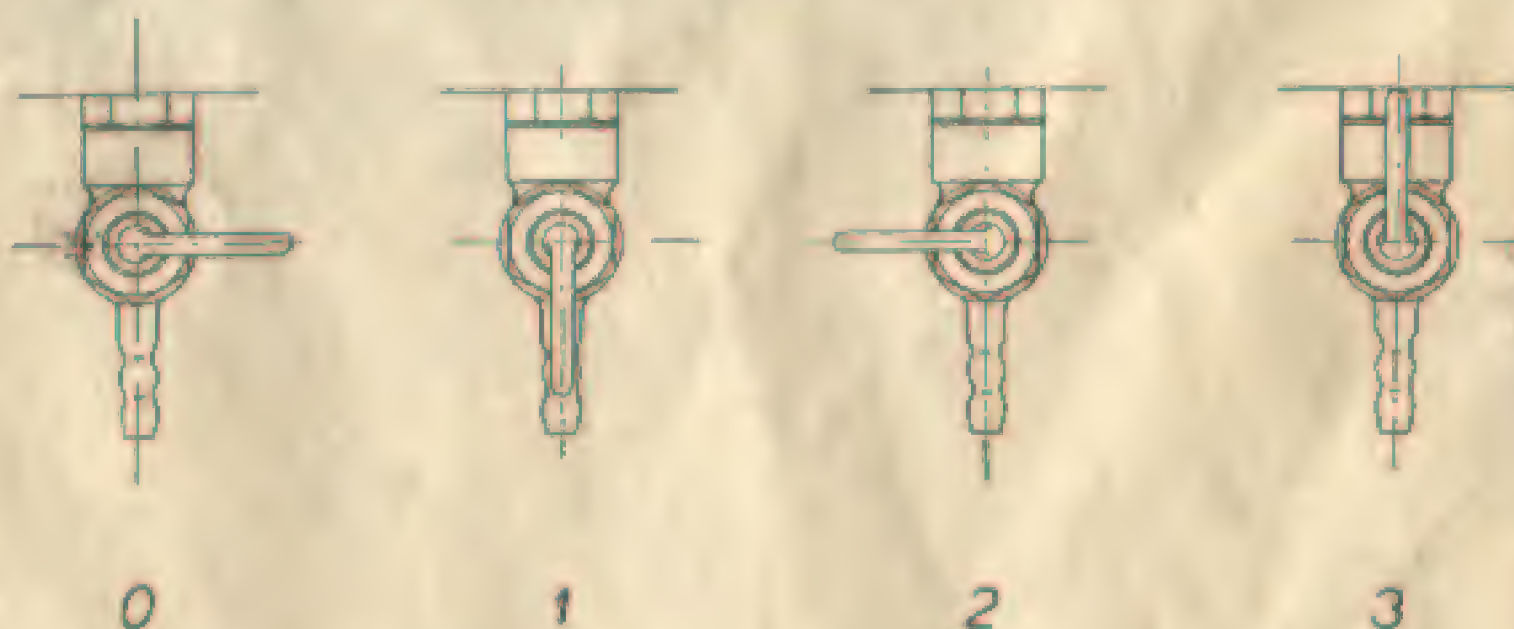


Fig. 8 - Fuel tap positions:

- |                           |                                |
|---------------------------|--------------------------------|
| 0 - fuel shut off         | 2 - fuel shut off              |
| 1 - fuel main supply open | 3 - fuel emergency supply open |

- a) Open the fuel tap (turn the lever downwards) and on the motorcycle 250 c. c. turn the choke ring located at the twist grip (Fig. 9). In case of the motorcycle 350 c. c. close the carburettor air-intake by turning the air cleaner strangler (Fig. 10) and flood the carburettor by pressing down the tickler pin. It is quite useless to flood the carburettor until fuel overflows to the induction silencer where it may catch fire.



Fig. 9 - Choke ring positions (250 c. c.)

0 - choke closed (when riding)

1 - choke open (when starting)

Flooding should be carried out only if the engine is cold, otherwise it may cause trouble when starting (the engine overfed by fuel). If that sometimes occurs, close the fuel supply and with the throttle fully open and ignition on, kick the starting lever down several times.

- b) Insert the key into the switch box and turn to the position 1 (in R. H. direction). If the battery is in order, the red tell tale bulb (L. H. side) will light up. If the yellow "N" tell tale bulb does not light up, shift into neutral between the bottom and second gear.
- c) With a slight pressure of the foot on the face provided on the gear change lever hub, press the lever towards the engine, rotating it at the same time into its starting position. Then start the engine by kicking the starting lever down. As soon as the engine has started, release the lever which automatically returns to its horizontal position. (If required the engine can be started with the gear engaged if the clutch lever is depressed.) Return the choke ring (or the butterfly air valve) to its bottom final position and let the engine heat for a while at low revolutions (high revolutions are harmful to a cold engine).





Fig. 10 - Butterfly air valve positions (350 c. c.)  
(vertical position - air closed  
horizontal position - air open)

## C. Riding

- a) Depress fully the clutch lever with your left hand, shift into bottom gear with your left foot by pushing the foot gear change lever upwards (at minimum revolutions only) and release the lever. Release also the clutch lever slowly while at the same time gradually opening the throttle. Ride immediately after engaging the gear - do not stay with the gear engaged and clutch lever depressed (this applies also to short stops on cross-roads).

As soon as a speed of 9 miles (15 km) is reached, close the throttle, push down the gear lever (engage the second gear) and reopen the throttle. Engage the other gears in the same manner. When changing down, the gear lever has to be lifted upwards. It is recommended to declutch at the beginning before the feeling is acquired at what speed to change without declutching.

It is pointed out that between the third and top gear is an unmarked neutral position. Both the neutral positions are engaged by shifting the gear lever half way between the two gears.

The lowest and highest speeds in the individual gears for run-in motorcycles:

	250 c. c.	350 c. c.
Bottom gear . . . . .	0— 22 m. p. h. (0— 35 km p. h.)	0— 25 m. p. h. (0— 40 km p. h.)
Second gear . . . . .	9— 34 m. p. h. (15— 55 km p. h.)	9— 41 m. p. h. (15— 65 km p. h.)
Third gear . . . . .	16— 47 m. p. h. (25— 75 km p. h.)	16— 56 m. p. h. (25— 90 km p. h.)
Top gear . . . . .	25— 68 m. p. h. (40—110 km p. h.)	25— 74 m. p. h. (40—120 km p. h.)

- b) When slowing down to a stop, close the throttle, shift the gears gradually into the neutral position between the bottom and second gears and only then apply the brakes. When braking, also use the front brake but only when travelling straight ahead and be careful not to cause a skid of the front wheel.

Having finished riding, turn off the fuel tap, return the switch box key to its "0" position and with draw it and, if required, lock the motorcycle by means of a padlock in order to prevent the use of the machine by other persons.

## 7. WHAT TO AVOID

Never leave the motorcycle for a longer time standing with the ignition on as the battery would become discharged or the resistances and ignition coils would be damaged.

It is harmful to let the engine run at high revolution while at a standstill as the engine is not cooled as during riding. Do not keep it declutched for any considerable time as the cork inserts of the clutch plates would be subjected to rapid wear. Never help the engine uphill by letting the clutch "slip" but change down in good time. Do not ride for long time with the bottom gear engaged. When riding downhill with the neutral position engaged and a stopped engine, it is afterwards necessary to start the engine by means of the kickstarter lever otherwise there is a danger of damaging the crankcase.

## 8. DETAILS TO THE MAXIMUM SPEED DATA

The maximum speed data mentioned in this manual are to be understood as the upper limit of the maximum speed attainable on this machine.

To which extent the machine approaches these maximum data, depends on several conditions. Ascertaining the real speed of the vehicle should be carried out only by means of the stop watches on a straight road in both directions in order to eliminate the influence of wind and the differences in the horizontal surface of the road.

Decisive factors besides the engine output are the sitting position and close fitting of the clothes of the rider, condition of the motorcycle and tyre pressure.



In case that all the above conditions are favourable, the motorcycle 250 c. c. attains speed 59—62 miles p. h. (95—100 km p. h.) - rider in normal sitting position and 65—68 m. p. h. (105—110 km p. h.) - rider crouching.

The motorcycle 350 c. c. can attain at the same conditions, a speed of 65—68 m. p. h. (105—110 km p. h.) - rider in sitting position and 71—74 m. p. h. (115—120 km p. h.) - rider crouching.

## II. MAINTENANCE

### 1. CLEANING THE MOTORCYCLE

The simple smooth lines of the motorcycles JAWA make it easy to clean. Use water for washing the motorcycle, preferably with a sponge. Wash with paraffin parts that have been soiled with oil and dust. When washing take care to keep the carburettor, headlamp and brakes clear of water.

Wipe dry enamelled and chromium plated parts and polish them with flannel or chamois leather. The enamelled parts can be polished with an enamel polish.

To remove water from the cylinder cooling fins, start the engine, the warmth of which will cause the water to evaporate. Do not ride in cold weather immediately after washing the motorcycle but leave it in a warm place until the cables are sufficiently dry. After starting, first check the function of the brakes. Dry the moistened brake drums by riding for a short distance with the brakes on.

**Note:** Petrol, paraffin and oil dissolve rubber (tyres, handlebar, grips, footrests). Consequently, protect the rubber parts from contact with the liquids mentioned. The tail lamp made of polystyrene has to be particularly

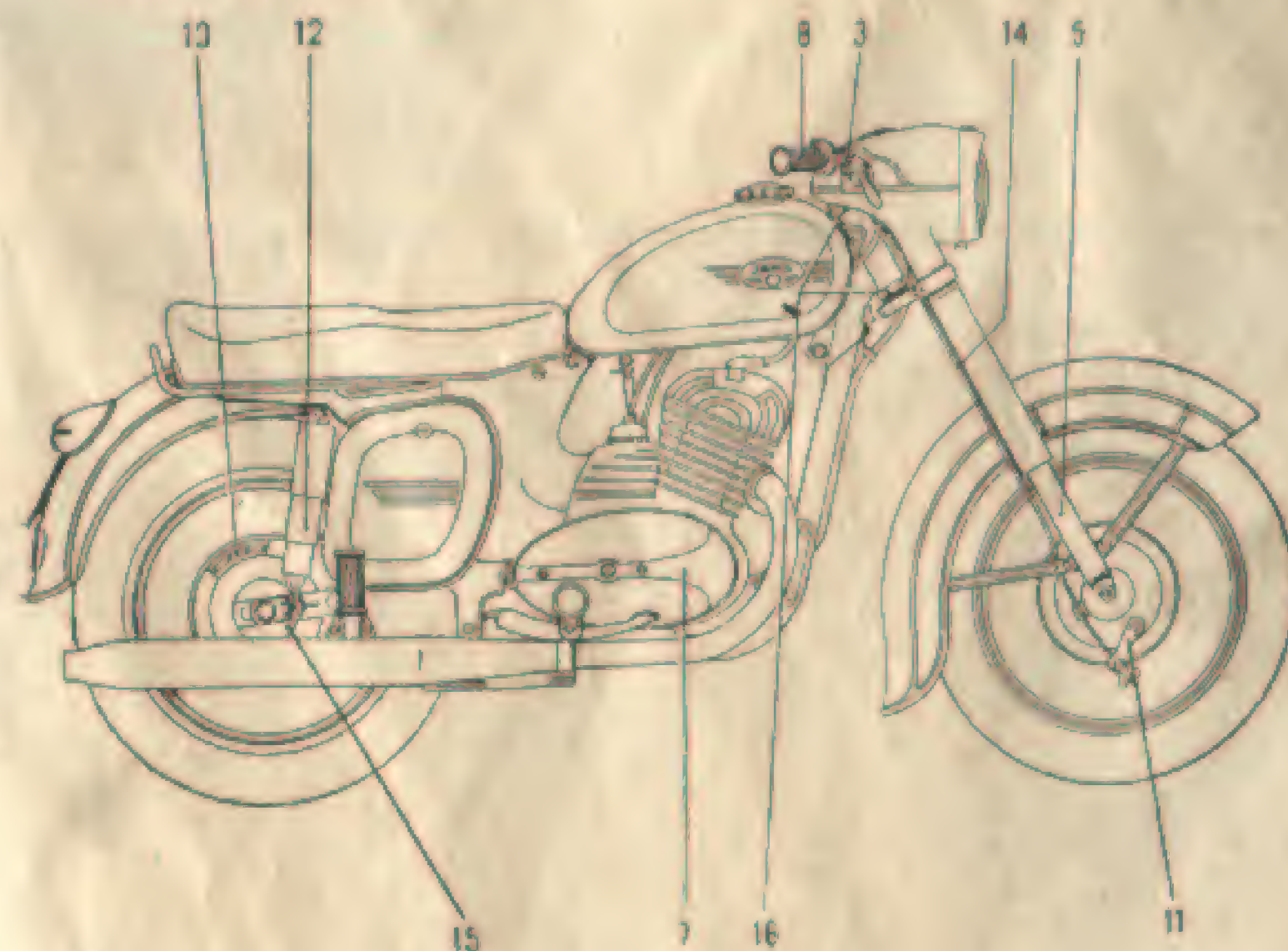


Fig. 11 - Lubrication chart - R. H. side



protected from contact with the mentioned liquids which have a harmful effect.

## 2. LUBRICATING THE MOTORCYCLE

The engine is lubricated automatically by adding oil to the fuel at a ratio 25 to 1 (approx. 1/2 pint to 1 1/2 galls). Fill the gearbox both in summer and winter with oil (0.8 litres) after every 3,000 miles (5,000 km). Change oil preferably after having finished a trip while both the engine and oil are warm. The warm oil will scavenge any accumulated sludge.

The draining screw is located on the L. H. bottom part of the crankcase (Fig. 14). Before filling with new oil rinse the gearbox with the rinsing oil in the following manner:

Pour about 500 c. c. (34 cu. in.) of rinsing oil into the gearbox filler neck (Fig. 13 - top arrow) and let the engine run at low revolutions for about 2 to 5 minutes (ride a short distance or put the motorcycle on the center stand). Change to all gears. Drain the rinsing oil into a clean container, let the impurities settle down and pour off the clean oil for further use.

Never use paraffin or fuel oil for rinsing as their remnants would reduce the lubricant capacity of the fresh oil. The correct oil level in the gearbox is determined by the inspection screw (Fig. 13 - bottom arrow). Check the oil level from time to time by unscrewing this screw and, if necessary, top up.

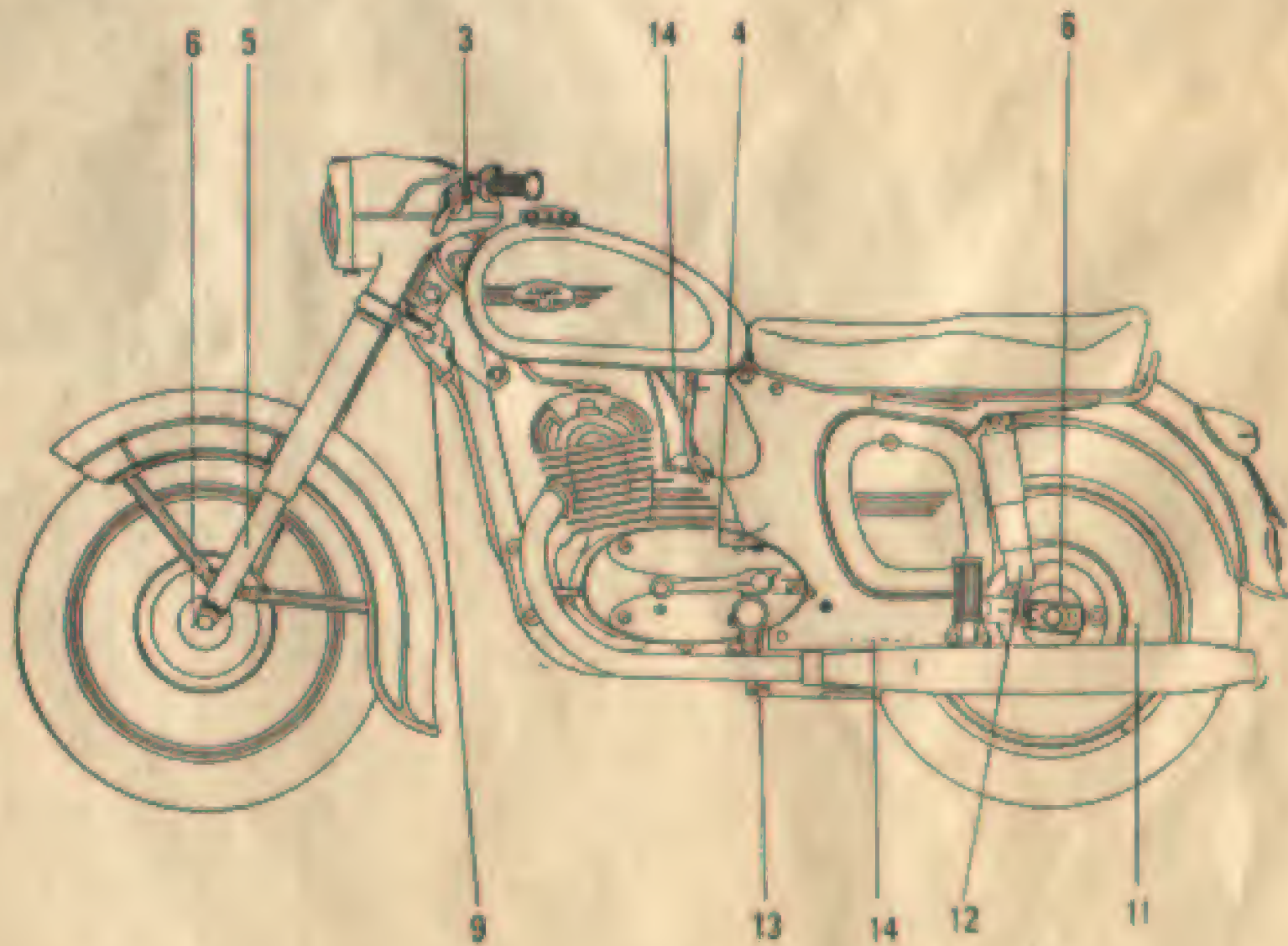


Fig. 12 - Lubrication chart - L. H. side

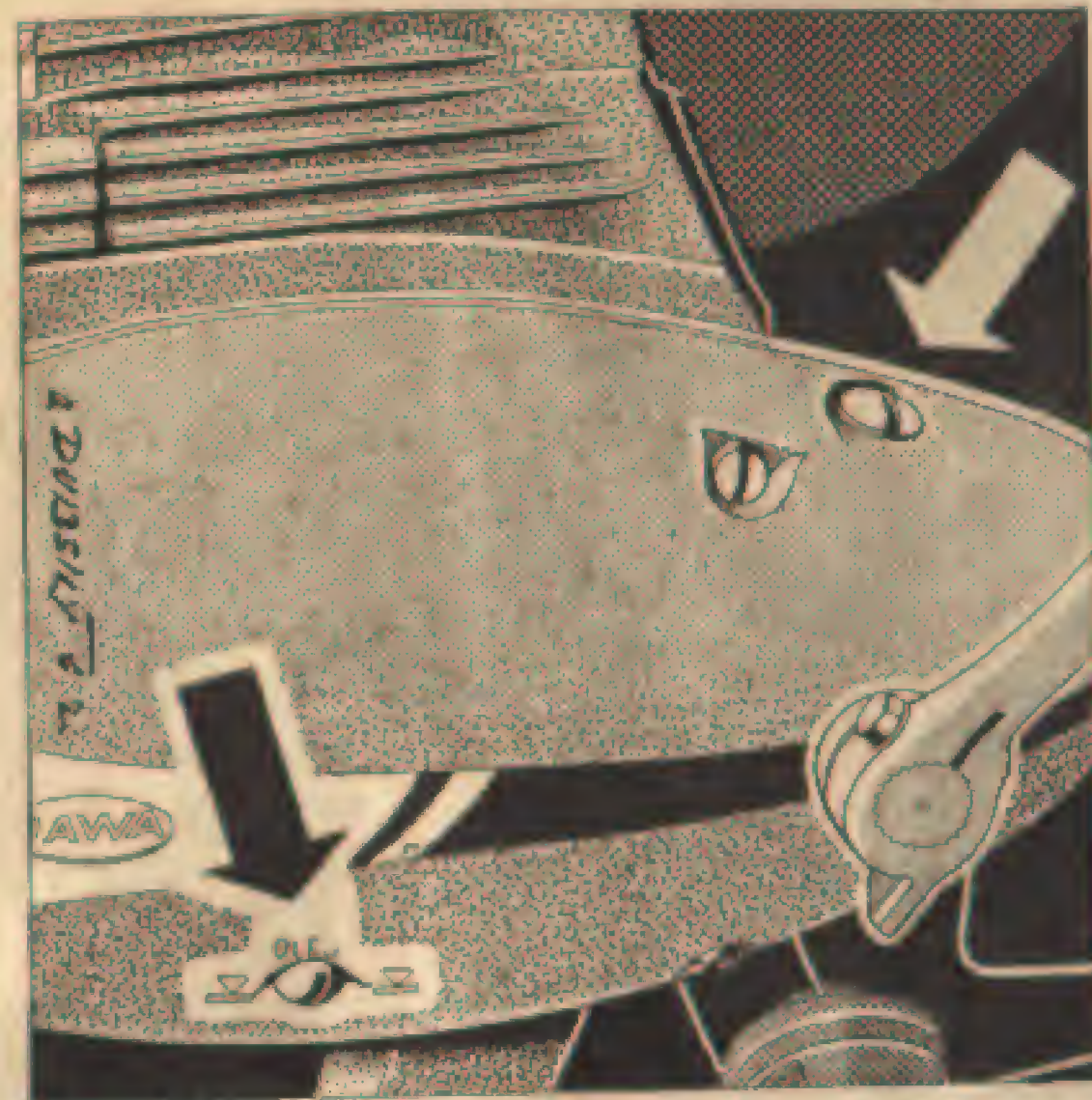


Fig. 13 - Oil filling and inspection hole

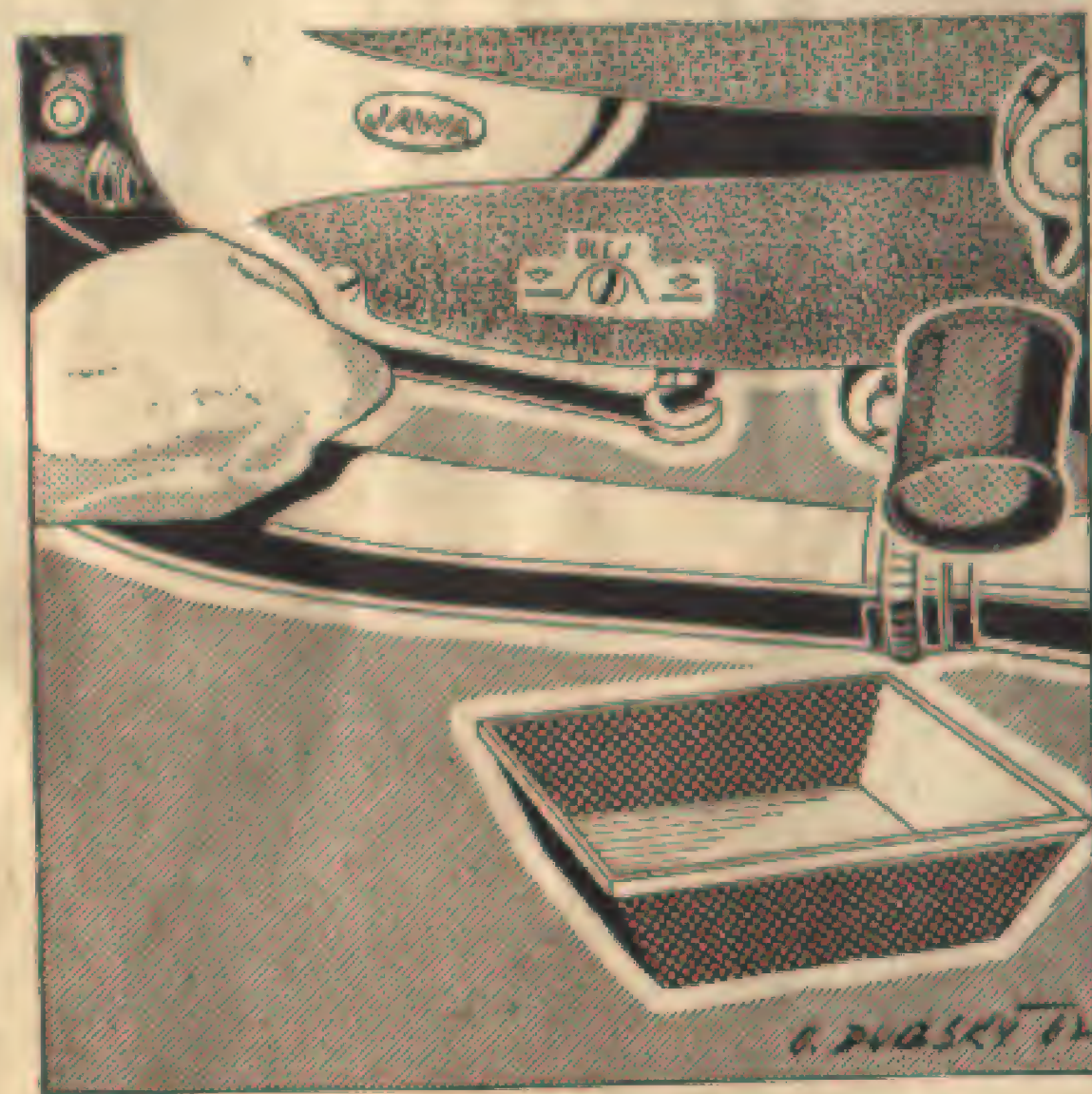


Fig. 14. - Draining the oil from the gearbox



# LUBRICATION CHART

Miles (km) covered	Lubrication point	Point No.	Total	Type of lubricant	
				Hot weather	Cold weather
300 (500)	Control lever pins (front brake, clutch)	3	2	Castrol Grand Prix SAE 50 Shell X 100 Motor Oil 30—40 Mobiloil BB	
600 (1,000)	Gearbox (topping up)	4	1	Castrol Grand Prix SAE 50 Shell X 100 Motor Oil 40 Mobiloil BB	Castrol XL SAE 30 Shell X 100 Motor Oil 30 Mobiloil ARC
	Rear (secondary) chain	10	1	Castrolase Graphited Shell Retinax A Cg. Graphited Grease No 3	
1,900 (3,000)	Contact breaker arm pins, speedometer drive	7	1 (2)	Castrol Grand Prix SAE 50	Castrol XL SAE 30
		9	1	Shell X 100 Motor Oil 40 Mobiloil BB	Shell X 100 Motor Oil 30
	Contact breaker felt	7	1	Castrolase Heavy or Castrolase LM Shell Retinax A Mobilgrease No 5	
	Twist grip	8	1	Castrolase CL or Castrolase LM Shell Retinax A Mobilgrease No 2 or MP	
3,000 (5,000)	Gearbox (change)	4	1	Castrol Grand Prix SAE 50 Shell X 100 Motor Oil 40 Mobiloil BB	Castrol XL SAE 30 Shell X 100 Motor Oil 30 Mobiloil ARC
	Brake cams	11	2	Castrol Grand Prix SAE 50 Shell X 100 Motor Oil 40 Mobiloil BB	Castrol XL SAE 30 Shell X 100 Motor Oil 30
	Control cables	14	3	Castrolase Brake cable Grease Shell X 100 Motor Oil 40 Mobiloil BB	

Miles (km) covered	Lubrication point	Point No.	Total	Type of lubricant	
				Hot weather	Cold weather
	Centre stand pin	13	1	Castrolase Heavy or Castrolase LM Shell Retinax A Mobilgrease No 5	
	Rear chainwheel bearing	15	1		
5,000 (8,000)	Steering head bearing ball	16	2	Castrolase Heavy or Castrolase LM Shell Retinax A Mobilgrease No 5	
	Wheels - bearings	6	2		
If neces- sary	Rear ssuspension dampers	12	2	Castrol Shockoil Shell Damper Oil Gg. Arctic Oil Light	
	Telescopic front fork	5	2		
1 to 25	With petrol			Castrol Two Stroke Oil or Castrol XL SAE 30 Shell X 100 Mobiloil TT	

The clutch runs in an oil bath (oil from the gearbox).

**The telescopic front fork dampers** (Fig. 15): After the first 600 to 900 miles (1,000—1,500 km) change the damper oil from both front fork legs. Change in the following manner: Remove the front wheel, unscrew the screw (22) on the bottom portion of the fork by about 7 mm, press it into the slider by means of the screw (22), rotate the end piece (19) through approx 90° and let the oil drain out. Now close the slider in the following manner: using the screw (22) turn the end piece (19) into its original position, i. e. **until the end piece (19) pin engages in the hole**. Tighten the screw (22).

After this first remove the battery fuse, then the headlamp rim with reflector, disconnect the speedometer, slacken the headlamp top nacelle rear screw and tilt the nacelle carefully (take care of the switch box leads). Unscrew the nuts (2) and pour approximately 200 c. c. of clean petrol into the holes. Push the sliders a few times into the stanchion tubes and drain the petrol in the same manner as the oil. Leave the interior of the fork to dry properly, close the bottom portion of the sliders and through the top hole of the tube fill **each fork leg with 140 c. c. of damper oil**. Tighten thoroughly the nuts (2) and fit the headlamp top nacelle.

There is no need to change the oil again - except if the fork is dismantled or if the worn seal has to be replaced; in these cases the fork must be filled with fresh oil.



**The rear dampers:** This type of damper has increased damping efficiency, enables the adjustment of spring hardness and the damper is designed so that no topping up with oil is required. It is however recommended to change the oil after 6,000 to 10,000 miles (10,000—15,000 km). It is also recommended to have any possible repairs, clearing the interior and oil changing (50 c. c.) done in a specialist workshop.

**Wheels (bearing)** have to be lubricated with the recommended kind of grease after removing the dust caps. Lubricate also the rear chain-wheel bearing (Part III, para 4 - Removing the rear chainwheel), after having first removed the rear chainwheel.

**The pivoted rear fork:** The pivoted rear fork pin is automatically lubricated with oil from the gearbox.

**The primary chain** is totally enclosed by the L. H. crankcase cover and runs in an oil bath. When the chain is worn, it should be replaced. When replacing the primary chain, the clutch should be dismantled (it is recommended to have this operation done in a specialist workshop equipped with suitable tools).

**The secondary chain** has to be serviced after every 600 miles (1,000 km). Wash the dismantled chain in paraffin. Let it dry and place it for about three hours in a slightly warm special grease. Take out the chain, let the surplus lubricant drip off and fit the chain again. Removing and assembling the chaincase and the chain is explained in Part III, para 3.

**Dynamo:** After 1,900 miles (3,000 km) remove the R. H. side crankcase cover and with a few drops of oil lubricate the contact breaker arm pin (pins). First carefully draw the contact breaker arm slightly out of the pin. Take care when lubricating, that the surplus oil does not get on the contact breaker points. The felt on the contact breaker base plate has to be soaked with grease.

**The control cables** - clutch, front and rear brake, throttle - (on the 250 c. c. machine also the choke cable) should be lubricated after every 1,900—3,000 miles (3,000—5,000 km) with a few drops of oil.

**The twist grip** should be lubricated after every 3,000—5,000 miles (5,000—8,000 km) with grease after removing the twist grip from the handlebars. Unscrew the screw, holding the plug, in the rubber grip and pull off the grip.

**The speedometer drive** should be lubricated with a few drops of oil every 1,900 miles (3,000 km) after removal of the headlamp rim with the parabolic reflector (Part III, para 10) and disconnecting the speedometer.

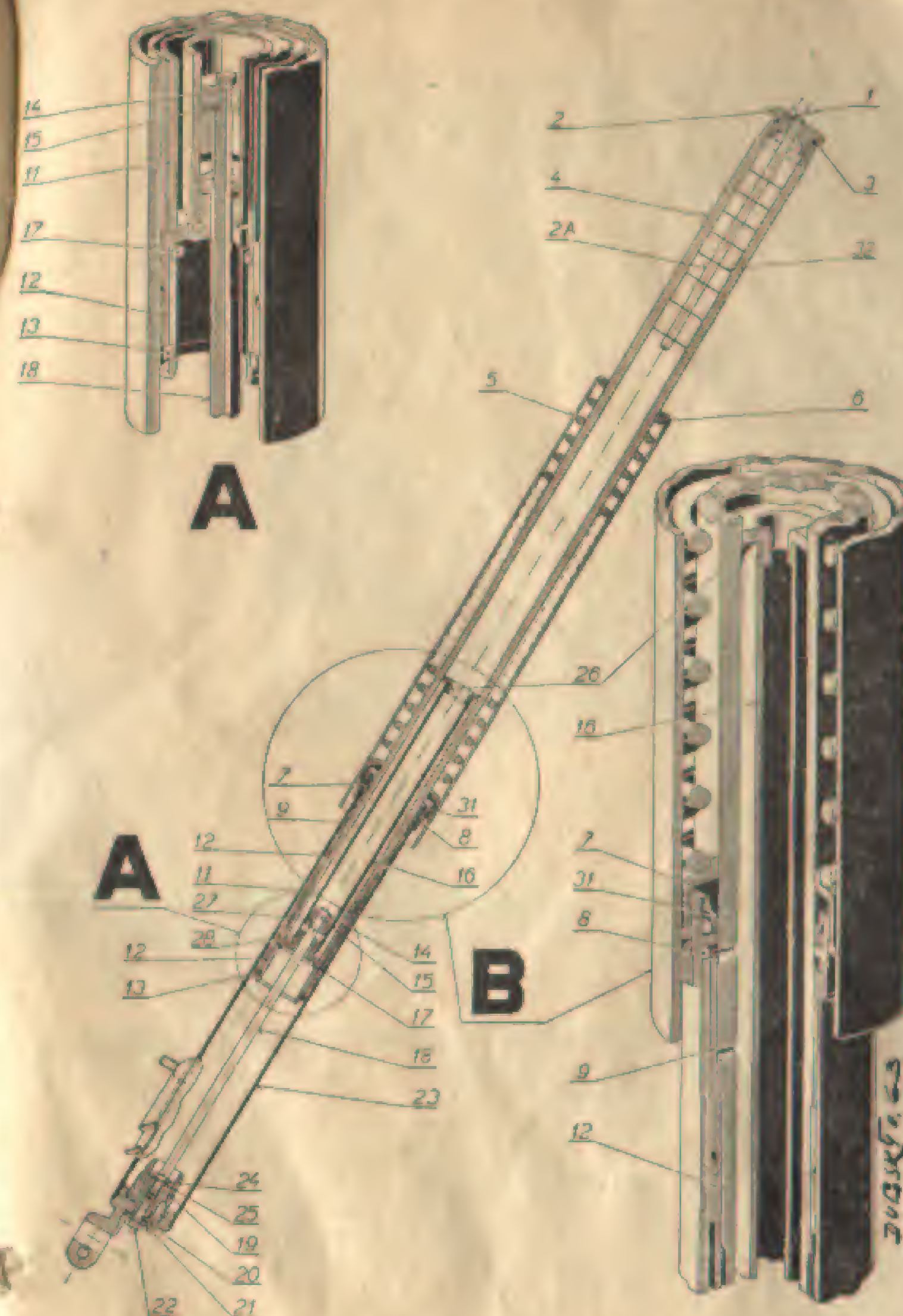


Fig. 15 - Front fork - sectional view

- |                 |                  |                         |
|-----------------|------------------|-------------------------|
| 1. Rubber plug  | 11. Spacer       | 21. Washer              |
| 2. Top nut      | 12. Bottom bush  | 22. Screw               |
| 2a. Rod         | 13. Bush circlip | 23. Slider              |
| 3. Rubber seal  | 14. Nut          | 24. Nut                 |
| 4. Tube         | 15. Washer       | 25. Washer              |
| 5. Spring cover | 16. Damper tube  | 26. Centering end piece |
| 6. Spring       | 17. Circlip      | 27. Piston              |
| 7. Nut          | 18. Damper rod   | 28. Washer              |
| 8. Fibre ring   | 19. End piece    | 31. Sealing ring        |
| 9. Top bush     | 20. Seal         | 32. Screen              |



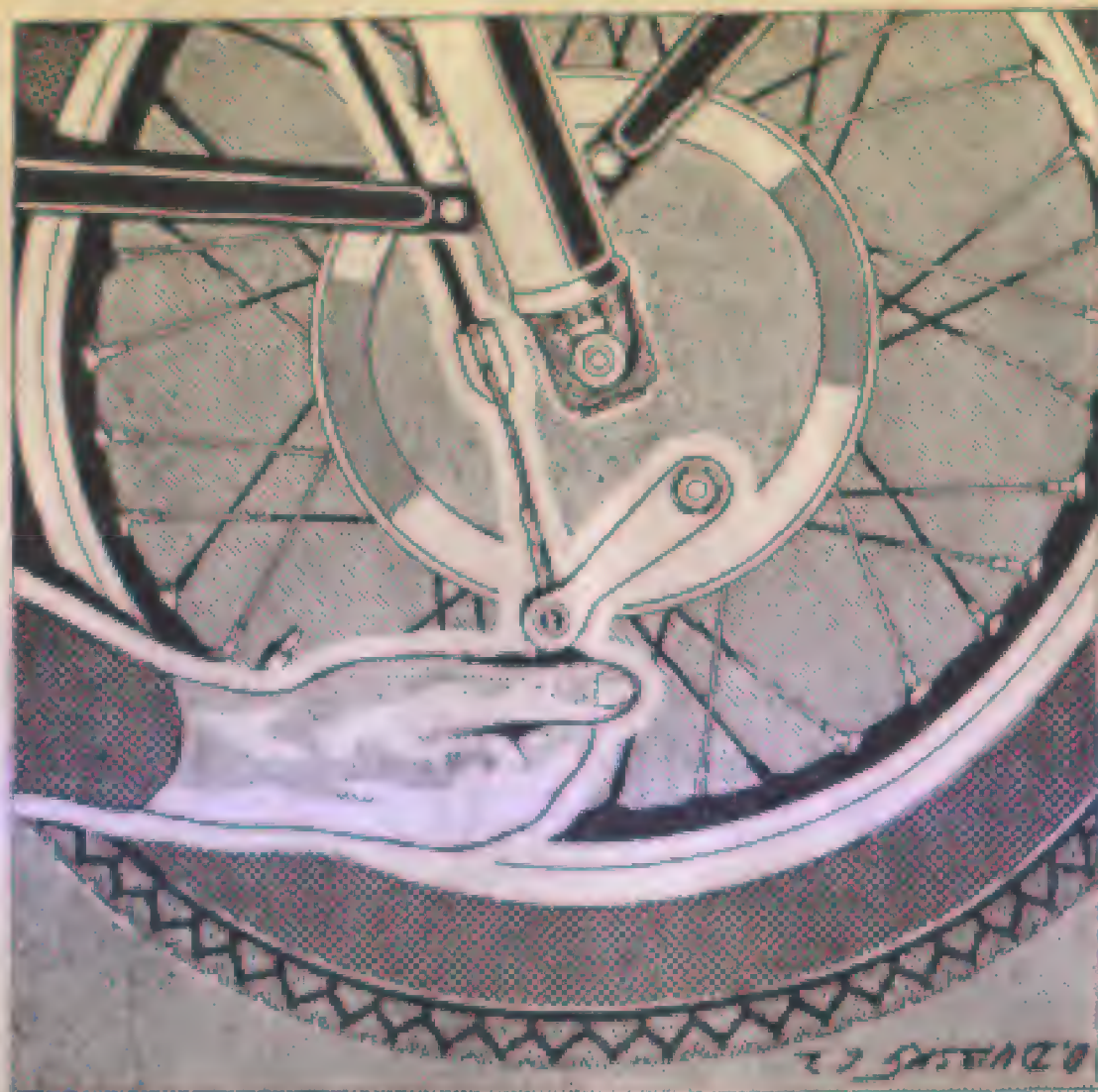


Fig. 16 - Adjusting the brake

The steering head bearing balls should be occasionally lubricated with grasee (see Part III, para 11), but at least once every 5,000 miles (8,000 km).

### 3. ADJUSTING THE BRAKES

The motorcycle width hub brakes are well dimensioned and are fully shielded against water penetration which could reduce their efficiency. The brakes require only occasional adjustment when the brake shoe lining is worn (excessive brake lever stroke). The brakes are adjustable by turning the adjuster nuts. After adjusting the brakes, check the wheels for free rotation. With the rear brake the stop switch has also to be adjusted (see Para 8).

### 4. TYRES

The life of the outer tyre cover depends on the inner tube air pressure in relation to the load carried. Running on under-inflated tyres will result in the cover wall cord threads breaking; over inflating the tyres decreases the correct function of suspension and the wheel is more inclined to skid.

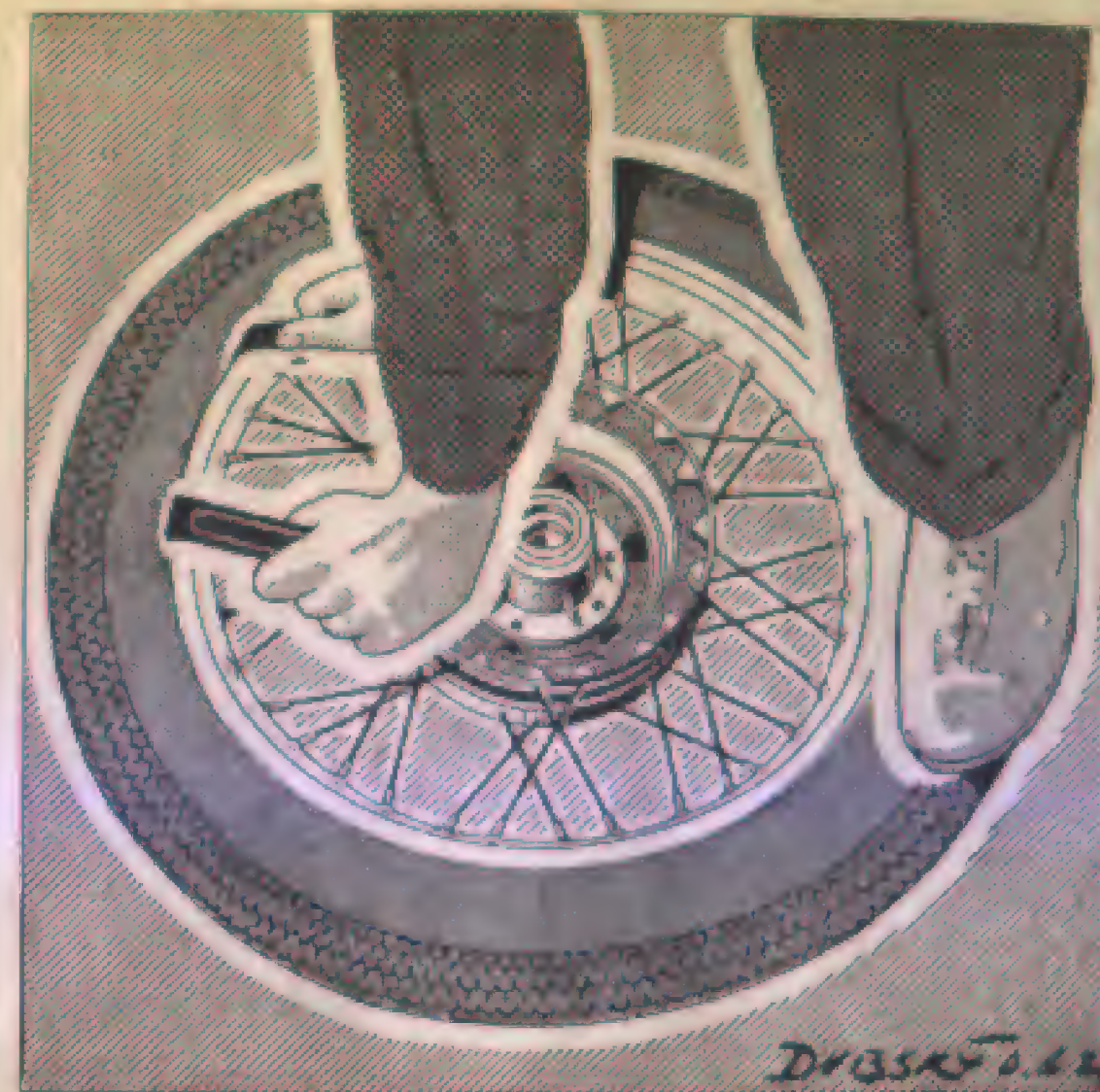


Fig. 17 - Correct tyre fitting

The correct pressure in the front tyre should be 18 lbs sq. in. (1.25 atm.), in the rear tyre 21 lbs sq. in. (1.50 atm. g.). **When riding with a pillion rider inflate the rear tyre to 28 lbs usq. in. (2 atm. g.).** It is recommended to check the pressure with the tyre pressure gauge. It is a known fact that the tyre pressure increases during long rides in summer (in hot weather). In addition the attention is called to the fact that oil, petrol and strong sunshine are harmful to the tyres. Examine the tyres from time to time and remove sharp gravels, glass, etc., stuck in the tyre pattern. Check the tyre valves for leakage by unscrewing the valve cap and moistening the valve. Should any bubbles appear, the valve is leaky. In such a case tighten the valve core (the slotted valve cap will serve for this purpose). Should the valve still leak, screw out the valve core and replace it by a new one. It is advisable to keep one or two cores as spares.

A punctured tube has to be patched. The tyre will have to be removed from the rim in the following manner:

Unscrew the valve core, deflate the tube completely and release the tyre on the whole circumference of the rim. Unscrew the nut securing the valve to the rim and press the whole valve into the rim. Lay the wheel in a horizontal position and press the tyre edge into the rim bare at a point **diametrically** opposed to the valve. Using the tyre levers, slip the tyre edge (in the vicinity of the valve) over the rim edge. Take care not to pinch the tube and thus damage it. Having slipped all the cover circumference over the rim edge, remove the tube. Having screwed in the



valve core and inflated the tube partially, the punctured spot will be best located by plunging the tube into water. Mark the punctured spot (e. g. with a pencil), dry the tube and repair it as follows: slightly rub the punctured spot with a piece of sand-paper and smear the rubber spot with rubber solution. Allow the solution to dry and only then put on the patch after first removing its protective coating. Press the patch well in to the tube, especially at its edges. Powder the patched spot with French chalk (talcum powder) to prevent the tube sticking to the inner walls of the cover at the spots where the solution was smeared. Examine the outer cover carefully and if the nail is still in it remove it with pliers.

#### Fitting the tyre:

Inflate the tube partially, and insert it in the cover, one edge of which has remained in the rim, push the valve through the rim hole and secure it by its nut (do not tighten). Slip on the cover side over the rim edge **beginning opposite the valve**, hold it in the rim recess and work with the tyre lever gradually on both sides towards the valve. Proceed carefully in order not to damage the tube by pinching it between the cover and rim edges. Carefully check whether the cover fits correctly in the rim, i. e. whether the wheel does not run out. The centering round projection serves for this purpose as it has to run in the same distance on the whole circumference of the rim.

Tyre patching is an emergency remedy only during a trip when a nail has punctured the tyre. For permanent repairs rely on vulcanisation by a repair shop. Rely also on the repair shop for repairing tyres damaged by sharp gravel or glass.

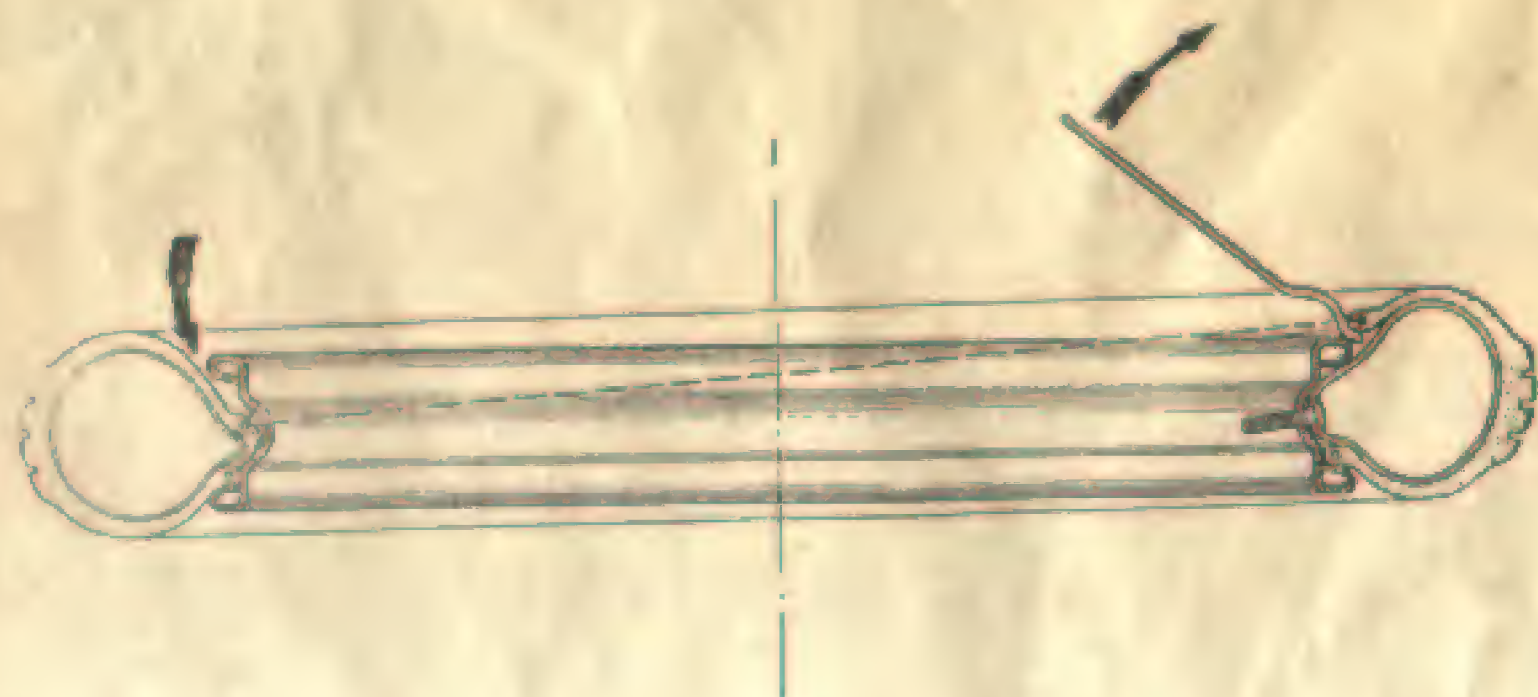


Fig. 18 - Rim and tyre - sectional view - fitting the tyre

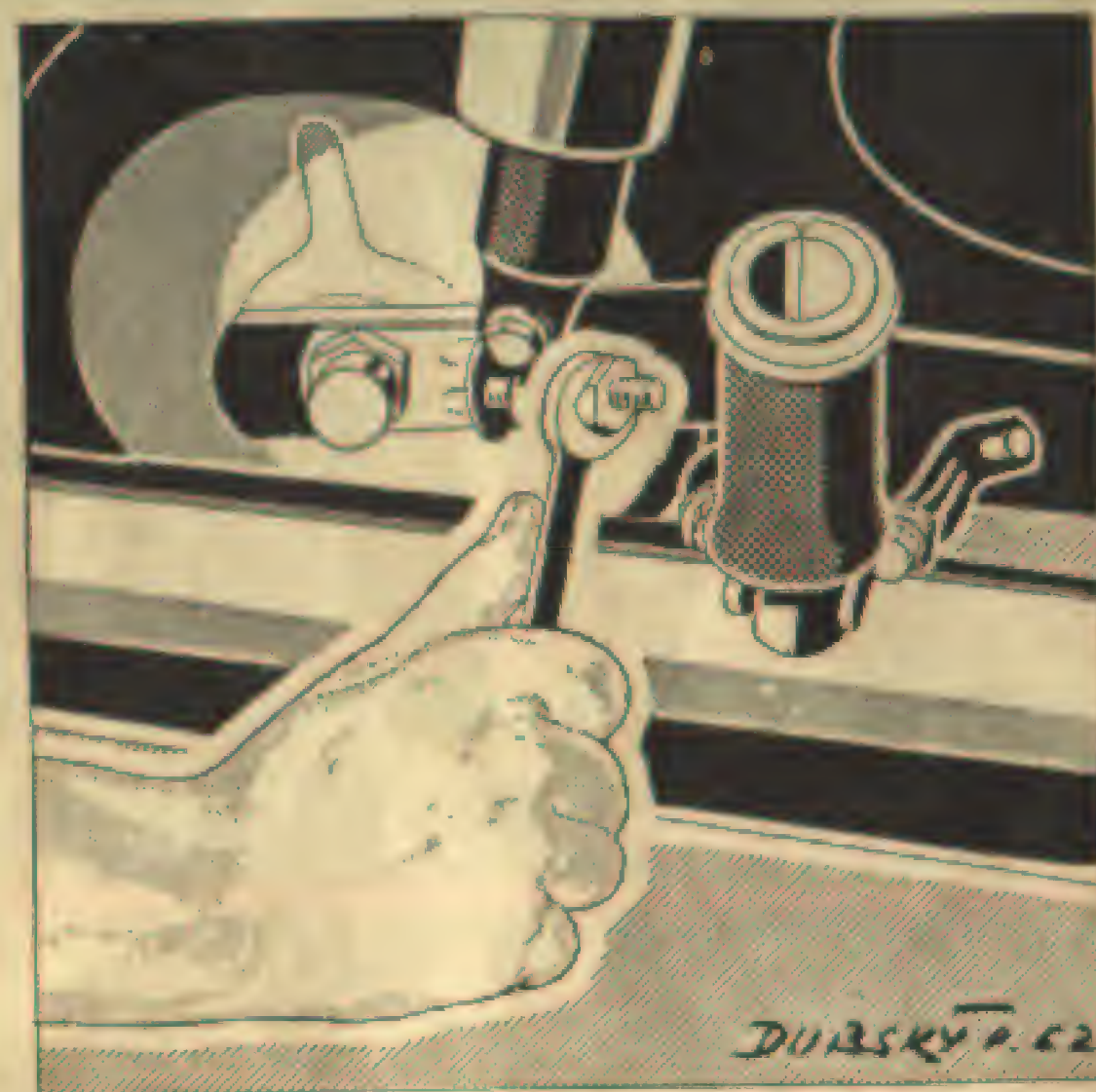


Fig. 19 - Adjusting the chain

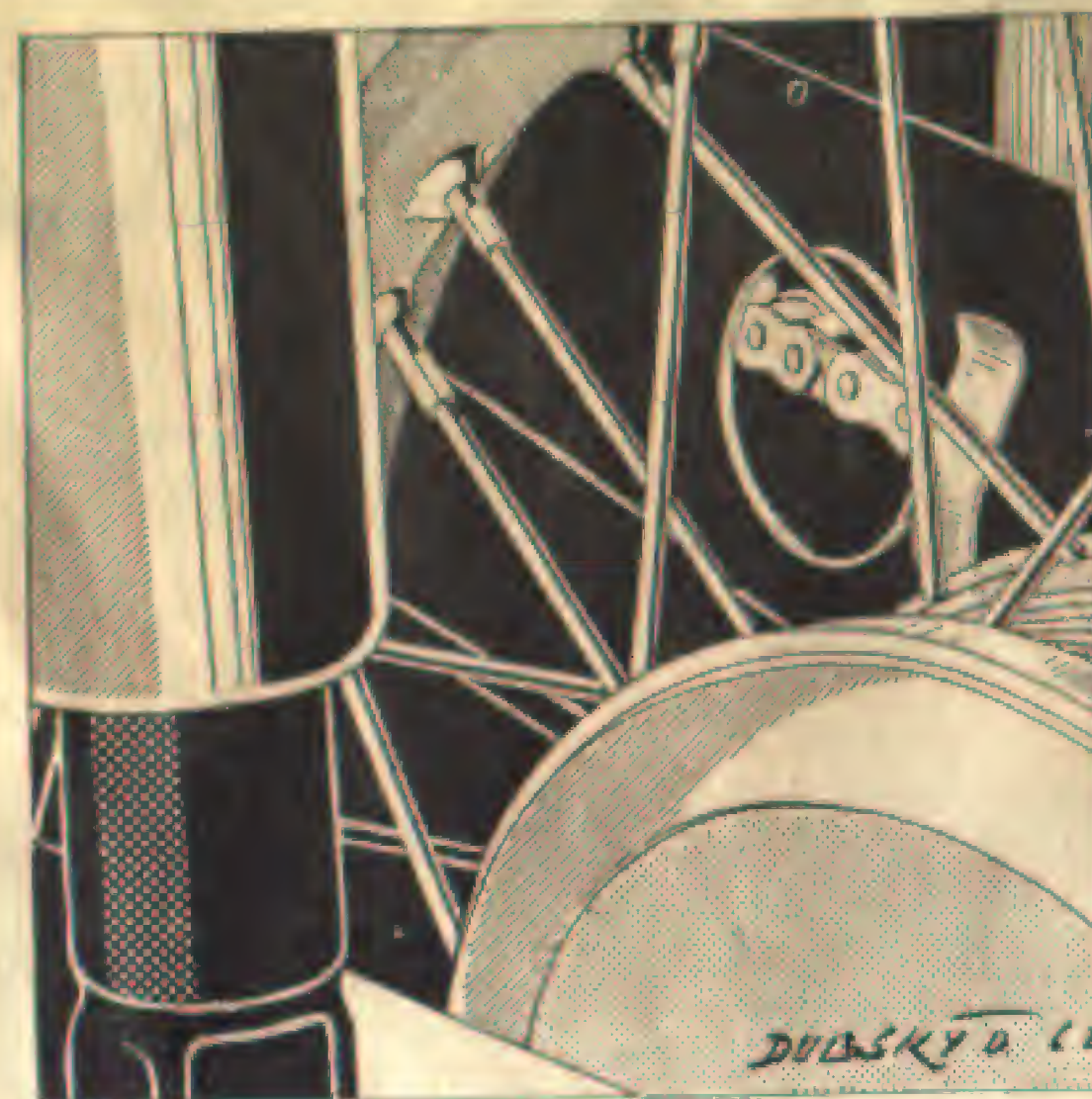


Fig. 20 - Chaincase control lid



## 5. ADJUSTING THE CHAIN

The correct maintenance and adjustment of the chain are the decisive factors for its function and long life. The necessary free movement of the chain in all pivoted fork positions is the main point to be followed, i. e. that in no position of the pivoted fork must the chain be fully tensioned. Adjust the chain in the following manner:

- Slacken the rear wheel spindle nut (on the L. H. side) and the chain-wheel sleeve nut (on the R. H. side). Then slacken the chain tensioning front lock nuts (on both R. H. and L. H. side) by two or three threads - according to the extent needed to adjust the chain correctly.
- Put the motorcycle on both its wheels and gradually tighten the chain, tensioning the rear nuts of the chain adjuster by the same value (e. g. by half a turn).
- The chain should be tensioned to such an extent that on depressing it by a finger through the chain controlling hole in the chaincase, the free movement should be of 1.2 in. (3 cm) at least, assuming that the machine is standing on both wheels (i. e. not on the stand). The



Fig. 21 - Clutch operation (automatic) diagram

- |                                       |  |
|---------------------------------------|--|
| 1. Kick starter and gear change pedal | 7. Disengaging mechanism carrying plate            |
| 2. Clutch operating rod with rear     | 8. Automatic disengaging mechanism adjusting screw |
| 3. Cup                                | 9. Automatic disengaging mechanism cam             |
| 4. Clutch                             | 10. Operating lever                                |
| 5. Clutch operating rod               |  |
| 6. Ball                               |  |

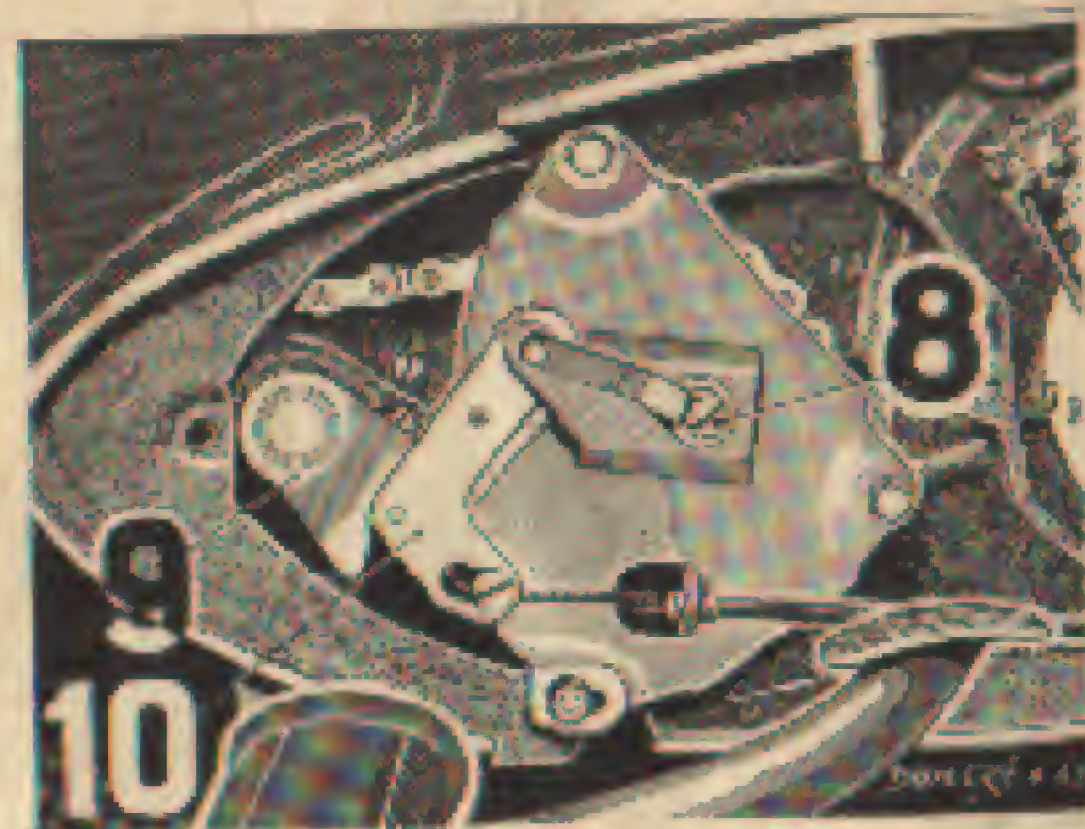


Fig. 22 - Adjusting the clutch

- |  |  |
|--|--|
| 8. Automatic disengagement mechanism adjusting screw | 9. Automatic disengagement mechanism cam |
|  | 10. Operating lever                      |

mentioned free movement of 1.2 in. (3 cm) ensures that by the springing of the pivoted fork of the loaded motorcycle the full tensioning of the chain will be avoided as otherwise its service life would be shortened or it may even cause damage to the rear chainwheel bearing.

- It is further necessary to make sure that the rear wheel does not run off the longitudinal line of the vehicle, i. e. that both wheels are in alignment. The incorrect alignment of the wheels (i. e. the rear wheel does not follow the front wheel track), unfavourably influences the riding quality of the motorcycle.
- Having adjusted the chain tension and wheel alignment first, tighten the sleeve nut and afterwards the spindle securing nut. Check again the chain tension and the wheel track and finally re-tighten the front securing nuts of the chain adjusters.

## 6. ADJUSTING THE CLUTCH

If it is ascertained when riding that the clutch is slipping, the fault can generally be remedied by turning the automatic clutch adjusting screw (8) in the R. H. cover opening by 1/6 or 2/6 turn to the left. It is recom-





Fig. 23 - Adjusting the clutch cable

mended to adjust the hand and automatic declutching from time to time in the following manner:

- Remove the R. H. crankcase cover (to facilitate it push the rear brake lever down).
- To release the hand clutch lever, shorten the clutch bowden by, screwing slightly the clutch adjusting screw (located on the clutch bowden underneath the head of frame).
- Clean with petrol or paraffin the dirt from the automatic disengagement mechanism cam (9) and from the operating lever (10).
- With the fingers of the left hand take hold of the operating lever (10) and move it towards the cam and back.
- If play is ascertained turn the automatic disengagement mechanism adjusting screw (8) clockwise until the gap between the operating lever (10) and the cam (9) is approx. 0.1 to 0.3 mm (the lever can be slightly moved from the cam without force).
- Adjust the hand disengagement with the cable adjusting screw so that the handlebar clutch lever has a slight play (approx. 2 mm) before engaging.
- Apply a light coat of grease to both the automatic disengagement cam (9) and the operating lever (10).

## 7. CARBURETTER

The carburetter has been set in the works for running-in purposes. After 1,200—1,500 miles (2,000—2,500 km) have been covered, be sure to re-adjust the carburetter according to the specification mentioned below, proceeding as follows: disconnect the throttle cable from the throttle valve, set the spring clip on the throttle needle to the specified notch. Adjust the pilot air screw by tightening it fully into the carburetter body and then slackening it the specified number of turns.

The most important components of the carburetter effecting the ratio of air - fuel mixture supplied to the engine are as follows:

- The main jet** - influencing the mixture ratio with the throttle fully open. Access is obtained after removing the carburetter and unscrewing the closing screw (1). When the jet is clogged with dirt, the engine either fails to fire or fires but stalls and lacks output.
- The throttle needle** - the position of which influences the ratio of the mixture at medium throttle opening. It is located eccentrically in the throttle valve and its cone engaging into the carburetter throat, gradually opens the larger passage to the diffuser, when the throttle valve lifts. The throttle needle can be vertically re-set in the throttle valve by means of the spring clip and notches. If the spring clip is set in the lower notch, the mixture is richer, if it is set in one of the higher notches, the mixture is weakened.
- The idling jet (2) and the position of the pilot air screw (3)** influence the mixture ratio with the engine idling or running at low revolutions. The pilot air screw controls the inner diameter of the air



Fig. 24 - JIKOV 2926 SD 11 b (250 c. c.) carburetter

1. Closing screw
2. Idling jet
3. Pilot air screw

4. Throttle valve stop screw
5. Choke



passage through which air is induced during the idling run of the engine. When tightening the screw, the mixture is richer, when, slackening, the mixture is weaker.

- d) **The throttle valve**, controlled by means of a cable fitted to the twist grip, opens and closes the supply of the mixture to the engine.
- e) **To facilitate starting** the JIKOV 2926 SD 11 b (JAWA 250 c. c.) carburetter is equipped with a choke supplying a richer mixture when starting the engine. In a special chamber of the carburetter is a small valve, which opens and closes the orifice from the choke chamber to the carburetter socket. The cable fitted to the choke valve is controlled by the ring with the finger stop on the R. H. handlebars next to the twist grip. Note - when starting a cold engine by means of the choke, it is absolutely necessary to close the throttle valve. Make sure when riding that the finger stop on the ring is turned to the bottom final position (see Fig. 9 - position 0), otherwise the engine would intake enriched mixture and the consumption of petrol would be very high. It is pointed out that in order to secure the full closing of the choke and thus avoid leakage of the enriched mixture to the engine when riding, the choke cable must have free movement of 2 mm, controlled at the choke chamber lid, at the close-up position of the choke (bottom final position of the finger stop).

To facilitate the starting of the cold engine, equipped with the JIKOV 2926 SBD 17b (350 c. c.) carburetter, the air-intake can be closed by the butterfly air valve (see Fig. 10).

It is not recommended to tamper with the carburetter, just clean it by washing it in petrol and adjust it according to the table. Slight deviation from the basic setting may be required with regard to the condition of the motorcycle, running in various climatic conditions or to the respective grade of fuel; adjust in this case the setting only according to the advise of the specialized distributors or repair shop.

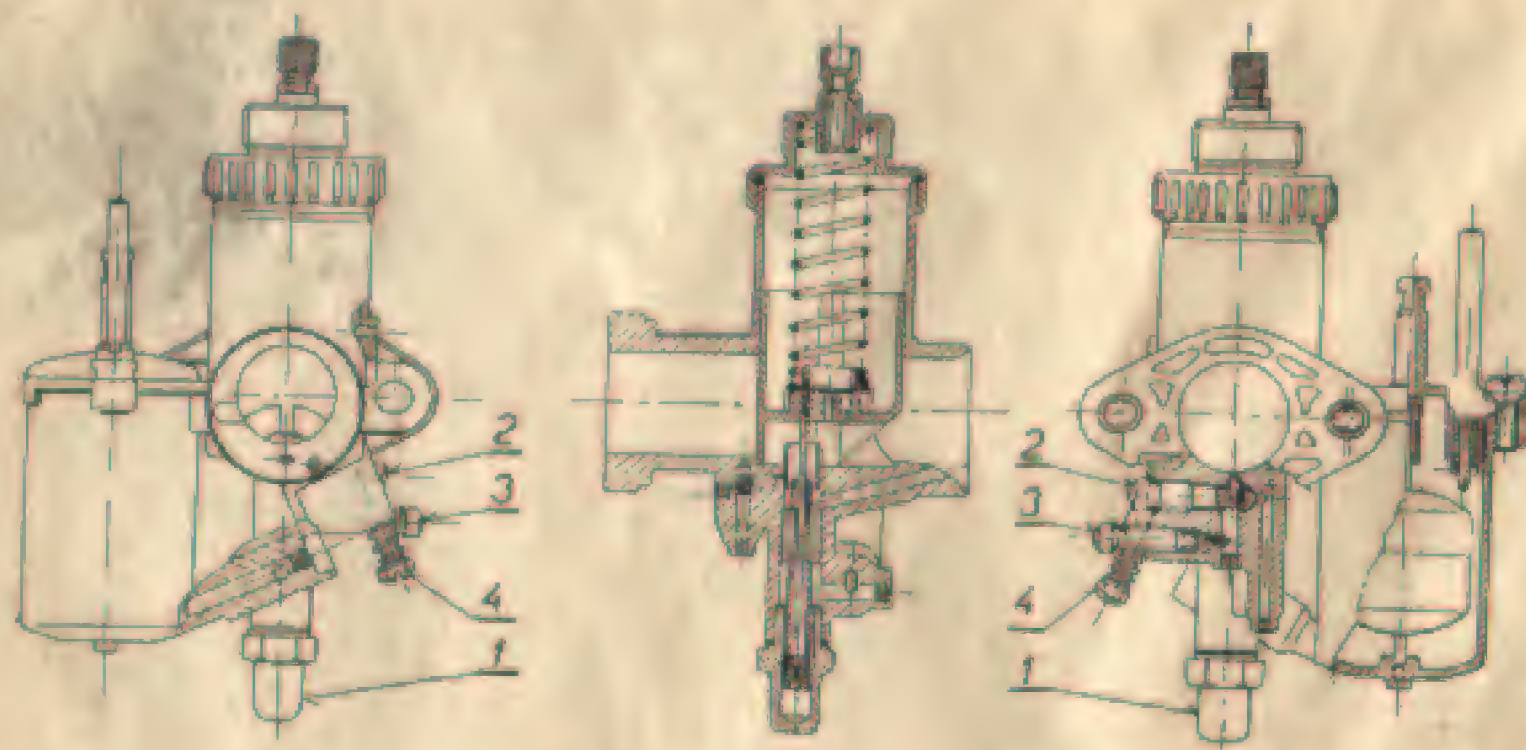


Fig. 25 - JIKOV 2926 SBD 17 b (350 c. c.) carburetter

1. Closing screw  
2. Idling jet  
3. Pilot air screw  
4. Throttle valve stop screw

The idling speed of the engine (working at low revolutions with fully closed throttle) can be adjusted by means of the throttle valve stop screw (4), which secures the correct position of the throttle valve. Adjust excessive free movement of the throttle cable by the knurled throttle cable adjusting screw located on the throttle chamber lid (the free movement of the throttle cable should be about 1.5—2 mm).

## Carburetter setting

Model	Carburetter		Main jet	Idling jet	Needle position	Pilot air screw slackened by
250 c. c. 559/04	2926 SD 11 b	For running in	96	50	3rd notch from top	$\frac{1}{4}$ - $\frac{1}{2}$ turn in LH direct.
		After running in	96	50	2nd notch from top	$\frac{1}{2}$ - 1 turn in LH direct.
350 c. c. 360/00	2926 SBD 17 b	For running in	96	50	4th notch from top	$\frac{1}{4}$ turn in LH direct.
		After running in	96	50	3rd notch from top	$\frac{1}{2}$ turn in LH direct.

To clean the carburetter dismantle it and wash the individual parts in clean petrol. Replace damaged and worn parts. Blow through the idling speed passages. Never use wire or hard tools for cleaning the jet as this may damage the delicate jet hole (and thus change the passage).

Take out the air cleaner after covering every 1,900 miles (3,000 km) and knock out all intercepted impurities. Do not wash or moisten the air cleaner with oil! The air cleaner is located in the induction silencer body underneath the dual seat and is accessible after removing the steel clamp and silencer cover as follows: lift the silencer cover, turn the air cleaner by 90 grades, press it to the right wall of the silencer body and shift out both silencer cover and the air cleaner from the R. H. side of the frame (be careful not to damage the electric leads). The air cleaner 350 c. c. motorcycles is accessible after freeing the two securing clips and the air cleaner top. Replace the air cleaner after covering every 12,400 miles (20,000 km). If you ride on dusty roads repeat the cleaning procedure more frequently. Wipe the interior of the induction silencer with a dry clean cloth.



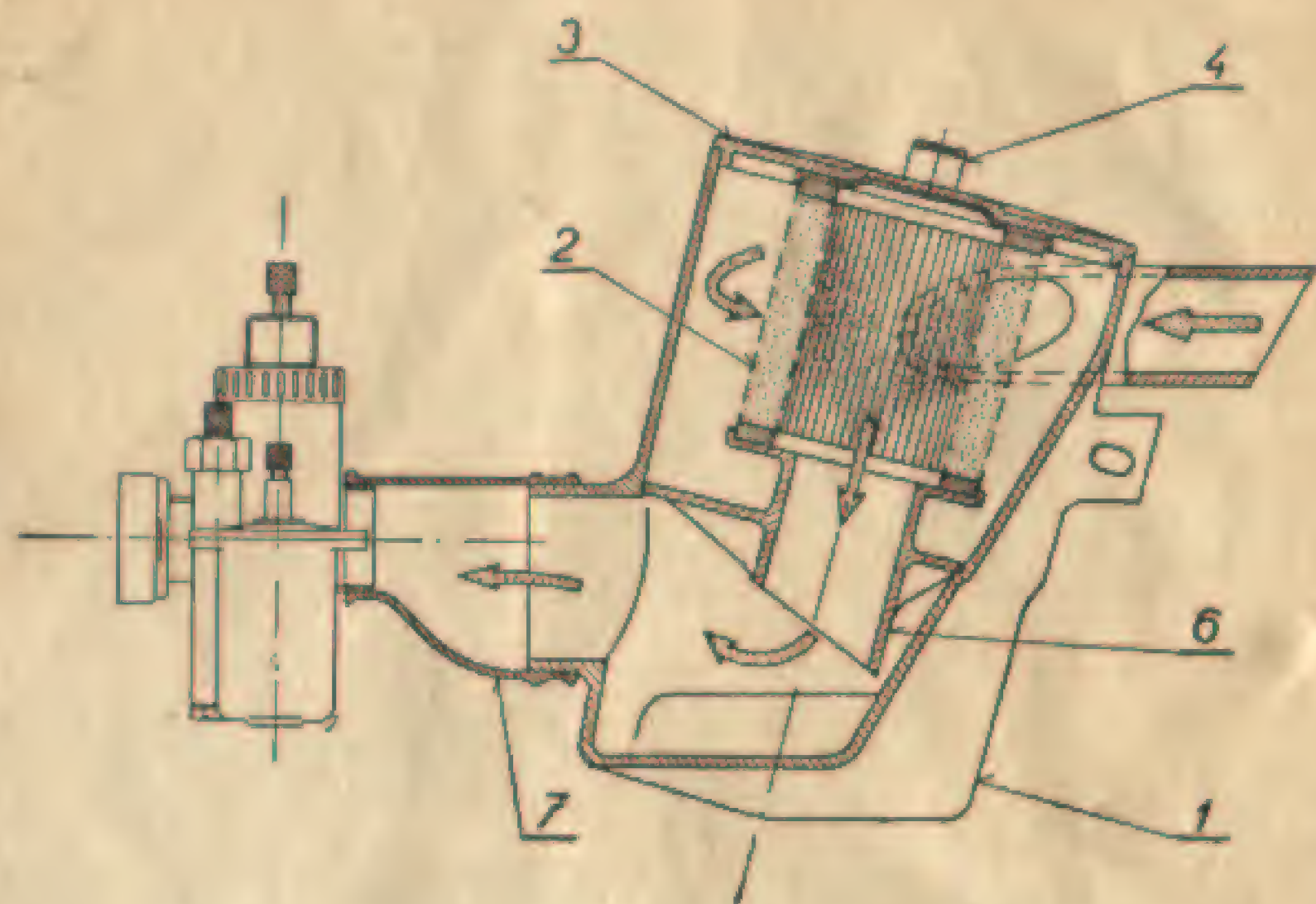


Fig. 26a - Induction silencer (250 c. c.) - sectional view

- 1. Silencer body
- 2. Air cleaner
- 3. Silencer cover

- 4. Clamp
- 6. Partition
- 7. Rubber connection

## Note

It is necessary to check from time to time the draining hole connecting the crankcase compartment under the carburettor with the space under the R. H. engine cover to see whether it is not choked with dirt and clean it, if required. The overflowing fuel from the carburettor resulting from carburettor flooding has to have the possibility to drain.



Fig. 26b - Removing the induction silencer top (250 c. c.)



Fig. 26c - Induction silencer (350 c. c.) - sectional view

- 1. Silencer top
- 2. Clip
- 3. Air cleaner

- 4. Silencer body
- 5. Rubber sleeve
- 6. Strangler



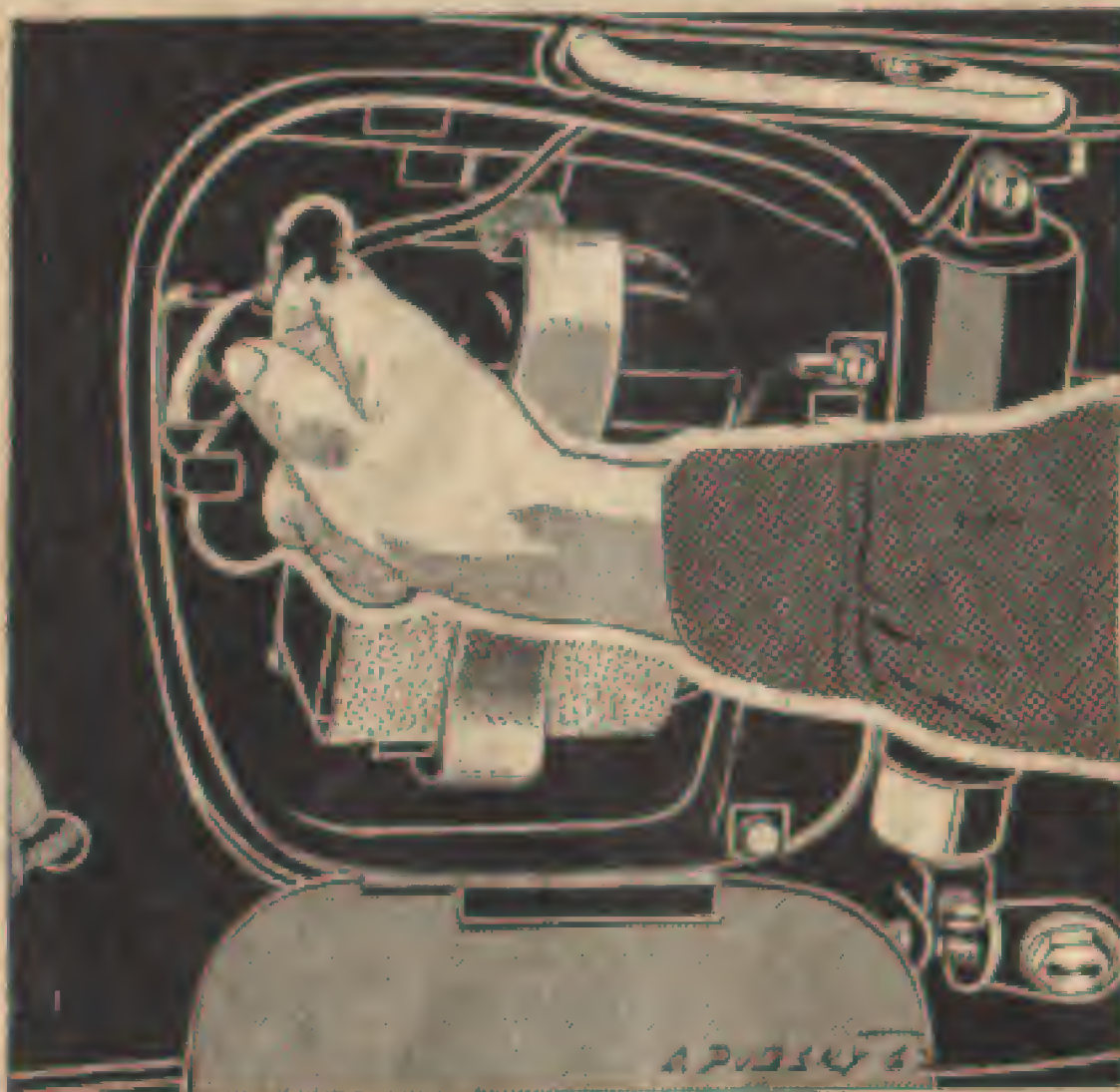


Fig. 27 - Removing the fuse

## 8. MAINTENANCE OF ELECTRICAL EQUIPMENT

Examine the leads from time to time and wind insulating tape round insulation cracks.

Clean the **spark plug** periodically. Carefully scrape off any carbon deposits, set the contact gap to 0.6—0.7 mm (spargink plugs PAL-RZ) by carefully bending the contact on the plug body.

The **fuse** is located in a bakelite case in the L. H. box next to the battery. When replacing never use a fuse stronger than 15 Amp.

To adjust the **stop switch**, slacken the screw and shift the bakelite body of the switch to the right or the left as required.

**Maintenance of the dynamo:** Check the dynamo after the first 300 to 600 miles (500—1,000 km) and, if necessary, adjust the contact breaker point gap and ignition advance (see para "Ignition Timing"). Check the brushes for wear every 6,000 miles (10,000 km). If the brushes are lower than 6/16 in. (8 mm) replace them. If there is no free movement in the brush holders they need cleaning. Remove the brush holders and clean them with petrol. Never file the friction surfaces of the brushes and be careful when re-assembling to replace them as they were originally. Clean the collector with a cloth dipped in petrol. Any major repairs to the dynamo should be carried out by a specialist repair shop.

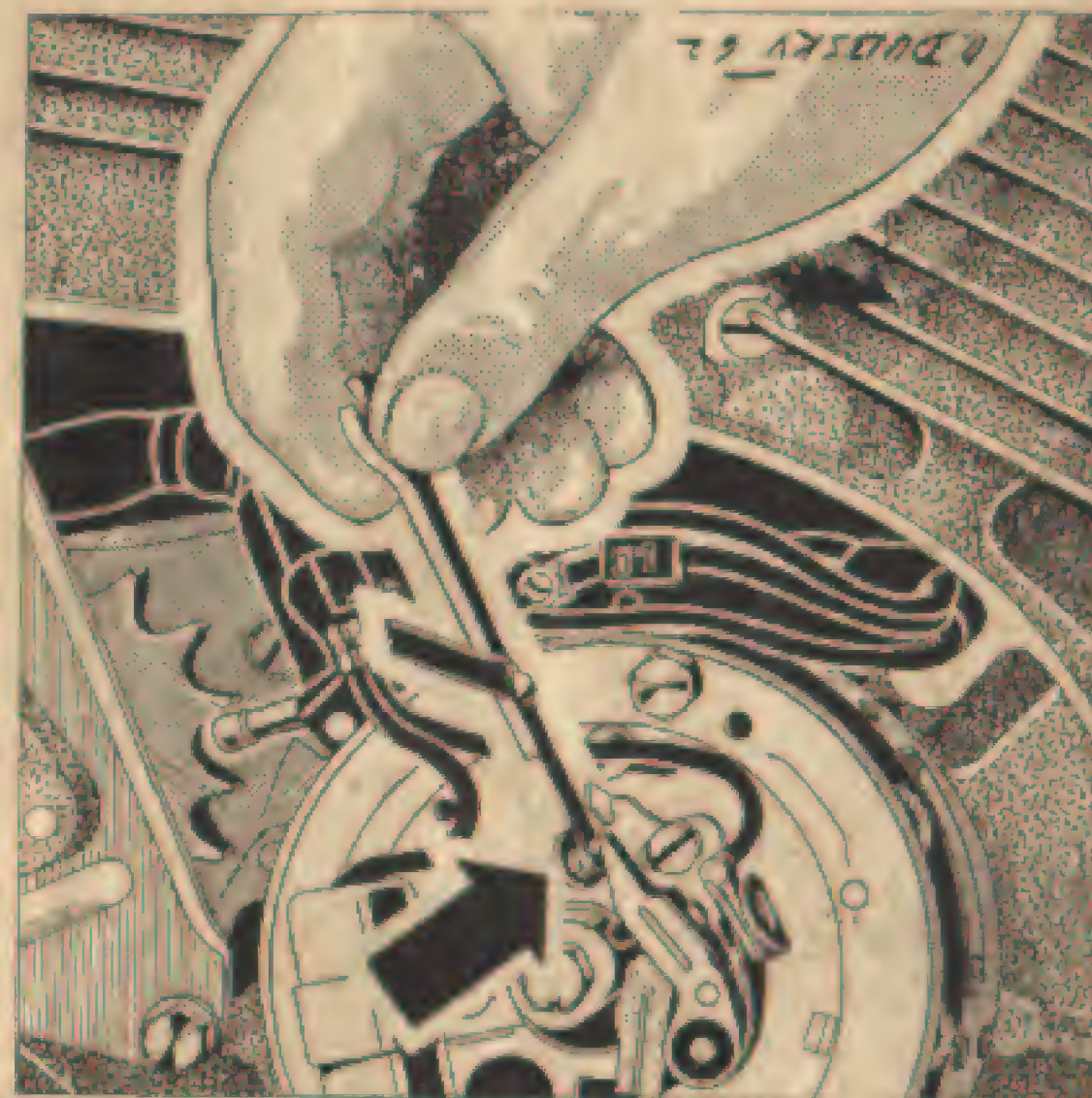


Fig. 28 - Gauging the contact breaker point gap-dynamo 250 c. c.

**Setting the ignition advance:** As this operation is carried out in the same manner for both the 250 c. c. and the 350 c. c. the more complicated setting, i. e. for the 350 c. c. is described hereunder. First set the R. H. cylinder ignition advance by the top contact breaker; the L. H. cylinder ignition advance is set by the bottom contact breaker.

Note: Control and tighten the stator fixing screws always **before** setting the ignition advance.

- Remove the sparking plug and insert the gauge in the sparking plug hole.
- Find the T. D. C. of the cylinder by rotating the crankshaft to the right (direction of running engine rotation).
- In this position set the contact breaker point gap by means of the adjusting screw. Measure the gap with the feeler gauge supplied with the tools. The thinner feeler (0.3 mm) should pass between the point sliding while the thicker one (0.4 mm) must not pass. Remove the fat from the contact points (use clean petrol) and if required spot-face by a smooth file. The contact breaker points must contact on the whole surface.
- By rotating the crankshaft to the left (in the opposite direction) bring the piston down by 3.5 to 4 mm for the 250 c. c. and 3.2 to 3.5 for the 350 c. c.

0.15 inches



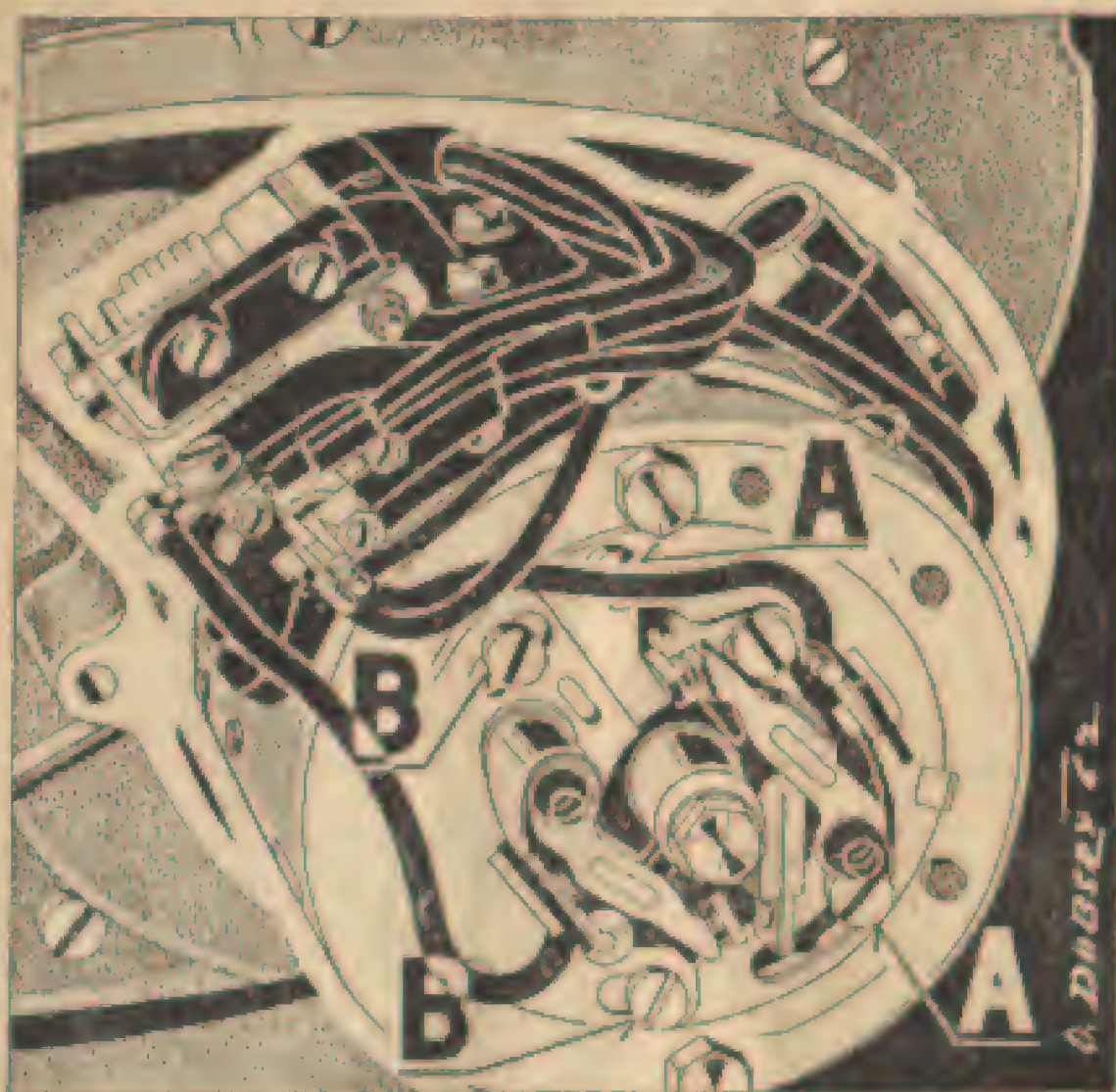


Fig. 29 - Dynamo 350 c. c.

- e) Check again in this position the contact breaker point gap which should not exceed 0.05 mm. Use the feeler gauge or a piece of cigarette paper both of which should be a sliding fit. *2 hole.*
- f) Should the gap be smaller or larger, slacken the two screws securing the contact breaker base plate to the dynamo stator and reset the correct gap of 0.05 mm by rotating the base plate to the right (making the gap smaller) or to the left (making the gap larger).
- g) After setting, retighten the screws.
- h) Setting the ignition advance of the second cylinder is effected in an identical manner, except that the bottom contact breaker base plate is used for setting.

## Battery:

The maintenance is simple but very important for the correct function and long life of the battery. It is, therefore, necessary to adhere to the following basic rules:

1. Do not use for filling up the battery so-called "technical sulphuric acid" but only chemically pure acid, diluted with distilled water to the specific gravity 1.28 (in tropical regions 1.23).

This point has to be carefully followed in order not to allow excess gassing which substantially shorten the life of the battery.

2. Top up the battery not higher than to the first separator above the plates (see Fig. 30 - the separator A). Excessive electrolyte could be sucked off to the prescribed level by means of the small suction balloon. If this advice is not followed excessive acid may overflow when riding and cause damage to the box and exhaust silencer.
3. Do not leave a fully filled battery which is **not charged** standing longer than 10 hours as the battery plates of a **filled and un charged** battery are subjected to chemical damage.
4. The electrolyte specific gravity at a fully filled battery must have the correct density of 1.28 (1.27 to 1.29), i. e. 30 to 32 Bé. The electrolyte specific gravity and the freezing point is changing according to the state of the charged battery as follows:

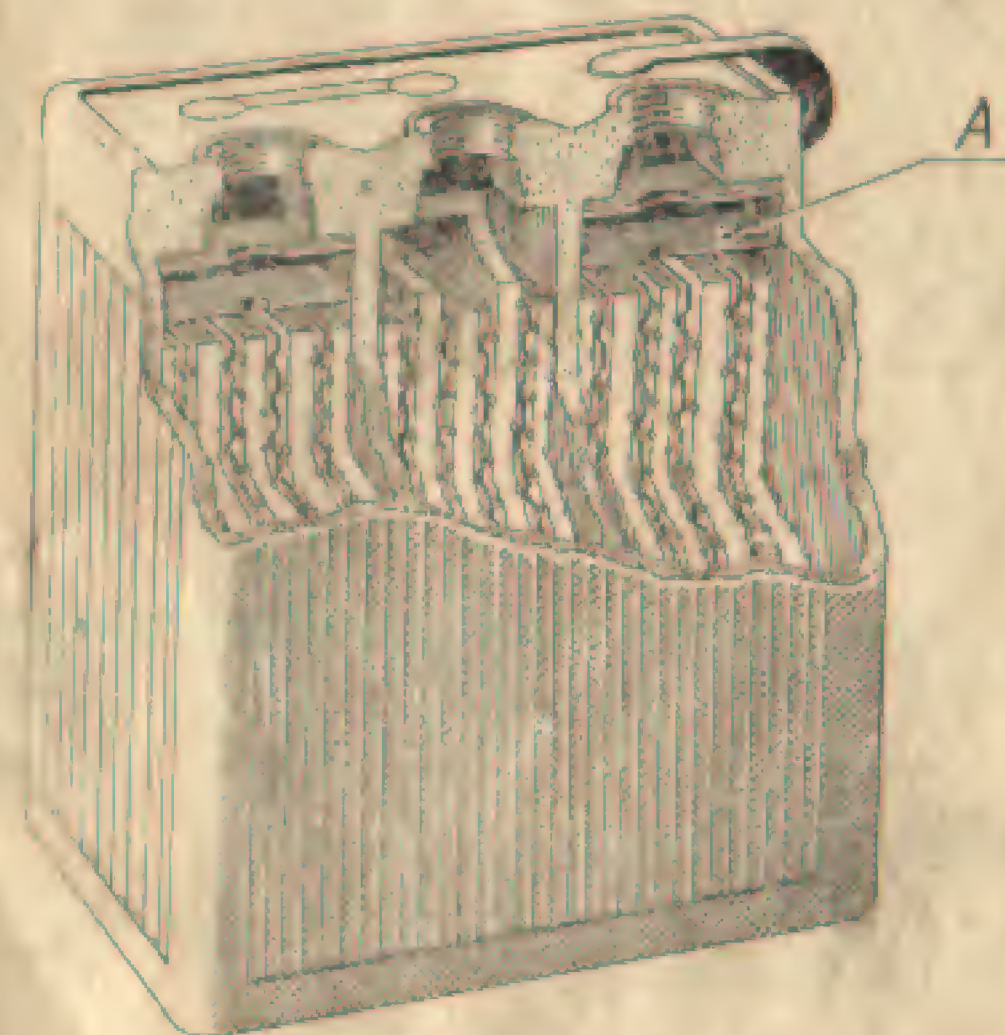


Fig. 30 - Correct electrolyte level in the battery

Battery charged	Electrolyte spec. gravity	Freezing point
fully charged . . . . .	1.28	-58 F (-50 C)
discharged by 1/4 . . . . .	1.24	-40 F (-40 C)
discharged by 1/2 . . . . .	1.23	-22 F (-30 C)
discharged by 3/4 . . . . .	1.18	- 4 F (-20 C)
dead . . . . .	1.14	+14 F (-10 C)

The above rules have to be strictly adhered to in order to safeguard the correct function and the long life of the battery.



## Connecting the battery:

1. Remove the inserts under the plugs or the strip on the plugs. Fill in all cells with **chemically pure** sulphuric acid (do not use technical acid) diluted with the distilled water to the density of 1.28 (in tropical regions to 1.23). Never fill the electrolyte higher than **up to the first separator** above the plates (see Fig. 30 - separator A).
2. Leave the battery for two to five hours and then top up again with the electrolyte to the prescribed level as per para 1.
3. Connect the battery with the D. C. current source of the approx. voltage of 8 V (connect the battery plus pole to the current source plus pole).
4. For charging the battery use 0.8 Amp current connected for about 50 hours to the voltage (charging source on) 7.9 to 8.1 V (i. e. 2.63 to 2.7 V per cell) and as long as the voltage does not vary for two hours.

Check after charging the electrolyte density, correct to the specific gravity 1.28 and top to the prescribed level.

5. Clean the battery, wipe it dry and connect to the machine with its plus pole to the motorcycle frame.

## Servicing the battery:

1. Keep the battery and its terminals clean and dry. Smear the connecting screws and lead eyelets slightly with protecting grease against oxides.
2. Check the electrolyte level by means of suction balloons every two months at least and if required top up distilled water to the prescribed level - **not higher** (see Fig. 30 - separator A).
3. The voltage and electrolyte density of each cell are the decisive factors to be checked when controlling the state of the battery.
4. If the motorcycle is not used for a long time (e. g. in winter), it is necessary to recharge the battery to its full capacity every 2 months as the battery is subject to self-discharging. The discharged battery can be damaged by means of the chemical substance.

Connect the battery with its plus (+) pole to the motorcycle frame. A wrongly connected battery would damage the regulator.

The headlamp beam is adjusted by tipping the parabolic reflector by means of the adjusting knob in the top portion of the headlamp rim.



Fig. 31 - Exhaust silencer - sectional view

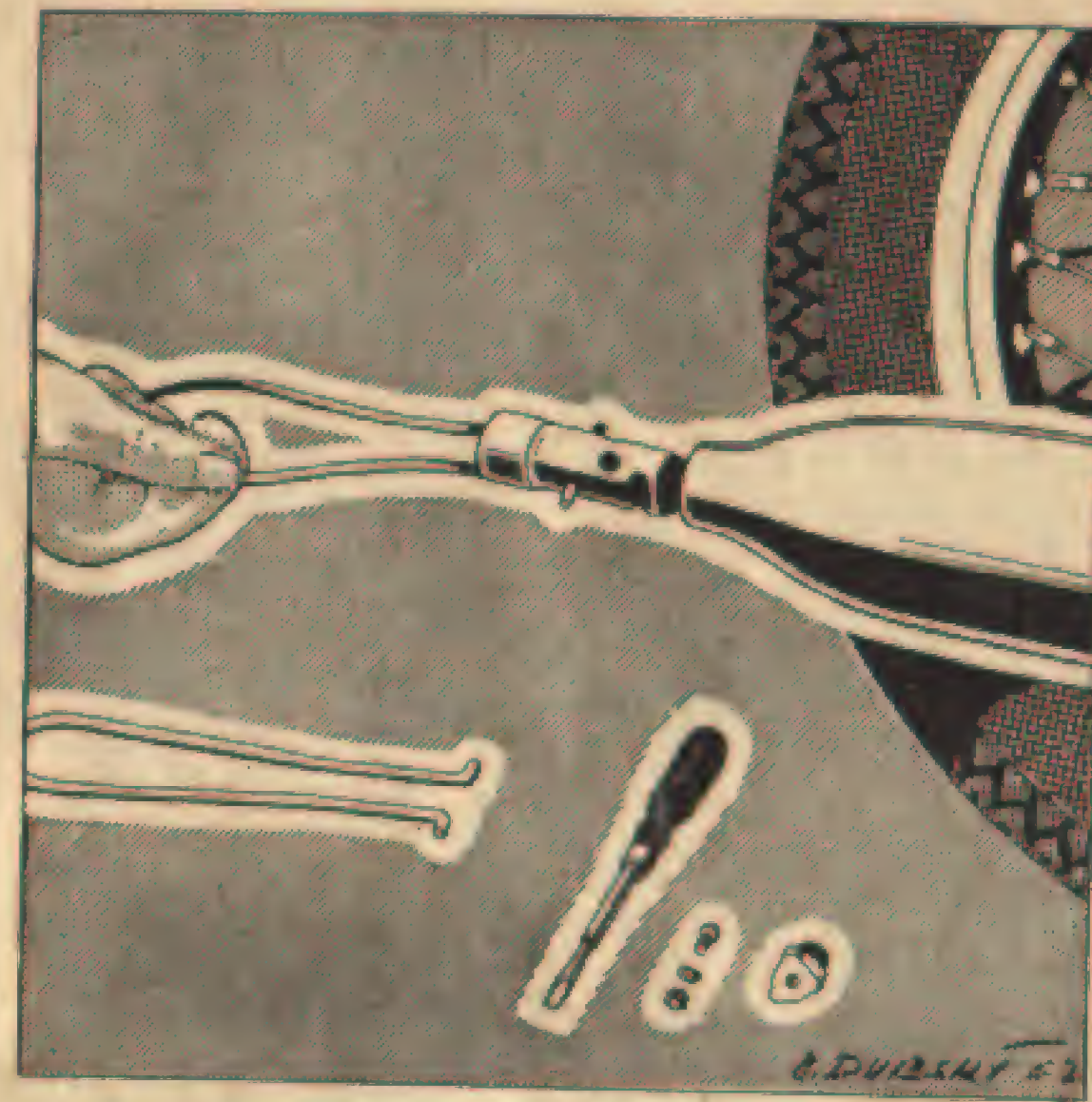


Fig. 32 - Taking out the exhaust silencer tube

After releasing the knob, push it forwards (backwards) until the headlamp beam is regulated. Having correctly set up the headlamp beam, tighten the adjusting knob again.

## 9. DECARBONISATION

After the first 1,900 miles (3,000 km) clean the exhaust silencer cores.

Clean them again after every 3,000 miles (5,000 km). Unscrew the fastening screw with nut from the side of the silencer rear end and remove the end tube. Using a suitably bent piece of wire (Fig. 32) pull out the inner tube and clean both the end piece and the inner piece thoroughly to remove all carbon deposits (preferably soak in petrol and light it). It is recommended to remove carbon deposits after every 3,000 to 6,000 miles (5,000 to 10,000 km) (for dismantling see instructions Part III, para 6). Burnt fuel residues (carbon deposits) cause a drop in the engine output as well as excessive heating of the engine. Remove the carbon from the piston, cylinder head and exhaust ports by careful scraping.

At the same time remove carbon deposits from the piston ring grooves (preferably with an old broken piston ring). When assembling, set the piston rings into the same grooves in which they were before being removed. Having scraped off the carbon, polish the respective parts and before reassembling wash them in clean petrol.



## 10. STORING THE MOTORCYCLE IN WINTER

If the motorcycle is not used in winter, store it after having finished a long trip so that the engine is well heated. Do not start the engine again after it has cooled down and during the winter season, especially for the short time at a standstill as the engine cannot be properly heated and consequently water vapour may condense on the inner parts of the engine and cause them to corrode and rust.

Remove the battery and maintain in during the winter season according to the instructions in para 8 "Servicing the Battery".

## III. DISMANTLING AND ASSEMBLING WITHOUT THE AID OF SPECIAL TOOLS

### 1. REMOVING THE FRONT WHEEL

Slacken the brake cable, unscrew the spindle nut and remove the spring washer. Slacken the tightening screw on the L. H. slider bottom end. Remove the spindle and the wheel.

When assembling push in the spindle, put the spring washer in its place (it must not be forgotten) and place the lock nut. Depress and release the front fork several times and only then tighten the L. H. slider bottom end screw. Check the suspension once more. Fit the brake cable and adjust the brake so as to allow free rotation of the wheel.

### 2. REMOVING THE REAR WHEEL

Release the rear brake cable (it is not necessary but it makes it easier to remove the rear wheel), slacken the spindle nut, remove the spring washer and pull out the spindle to the R. H. side. On the L. H. side remove the brake reaction bracket, slide the wheel off the driver splines and having inclined the motorcycle to L. H. side remove the wheel.

When assembling proceed in the reverse order (do not omit to replace the spring washer) and tighten the spindle lock nut fast. Fit the rear brake cable and adjust the brake so as to allow free rotation of the wheel.

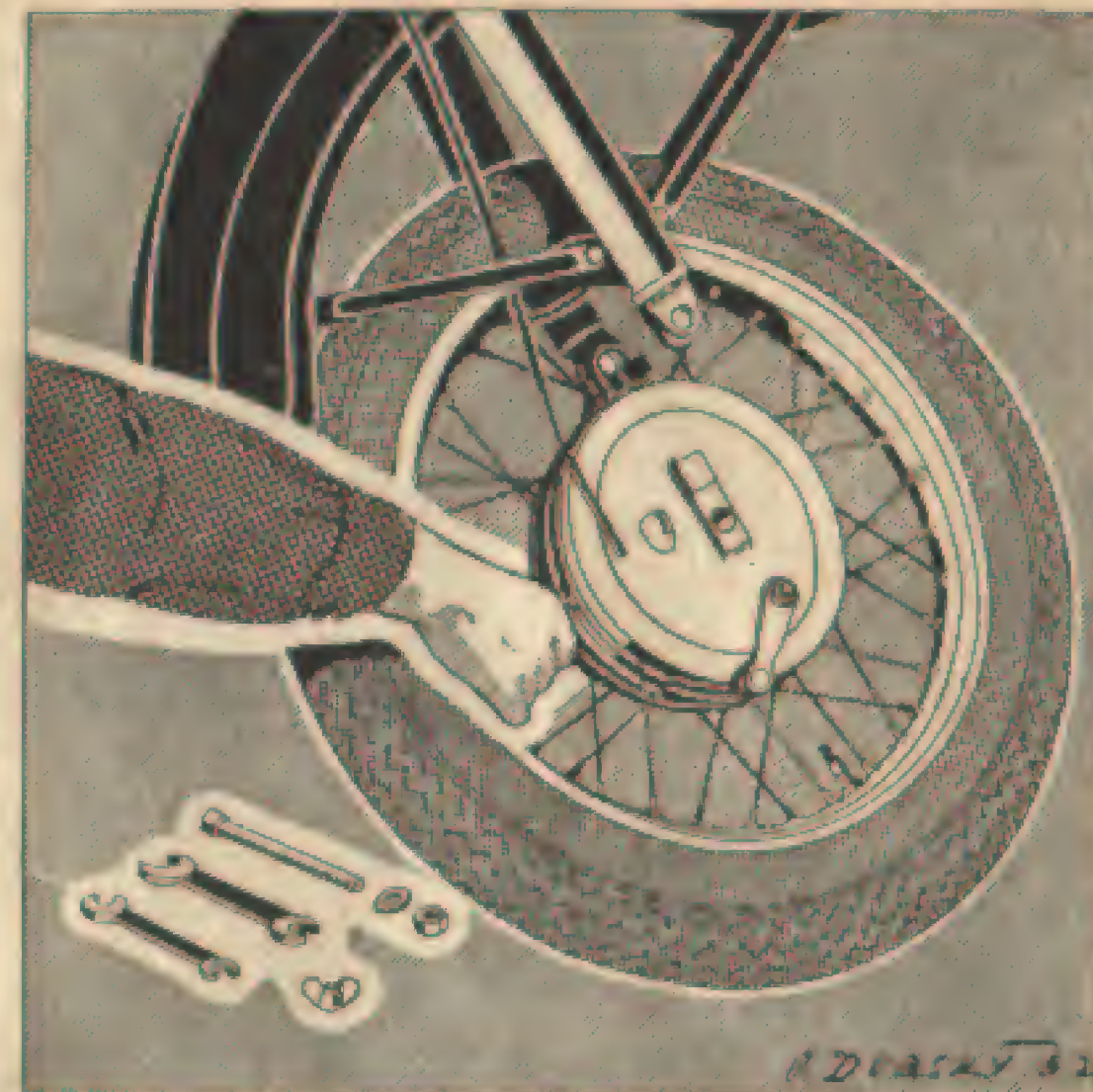


Fig. 33 - Removing the front wheel

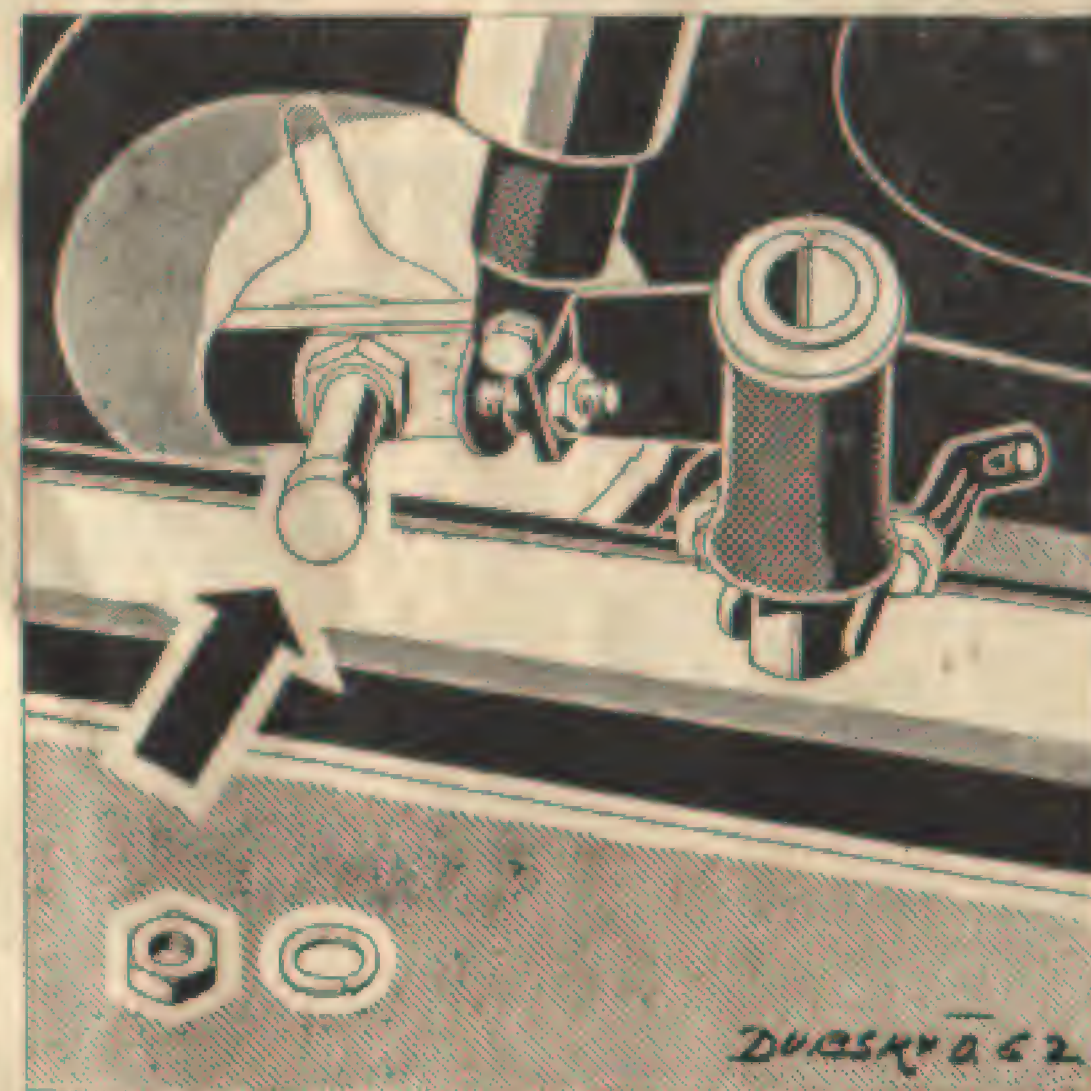


Fig. 34 - Taking out the rear wheel spindle



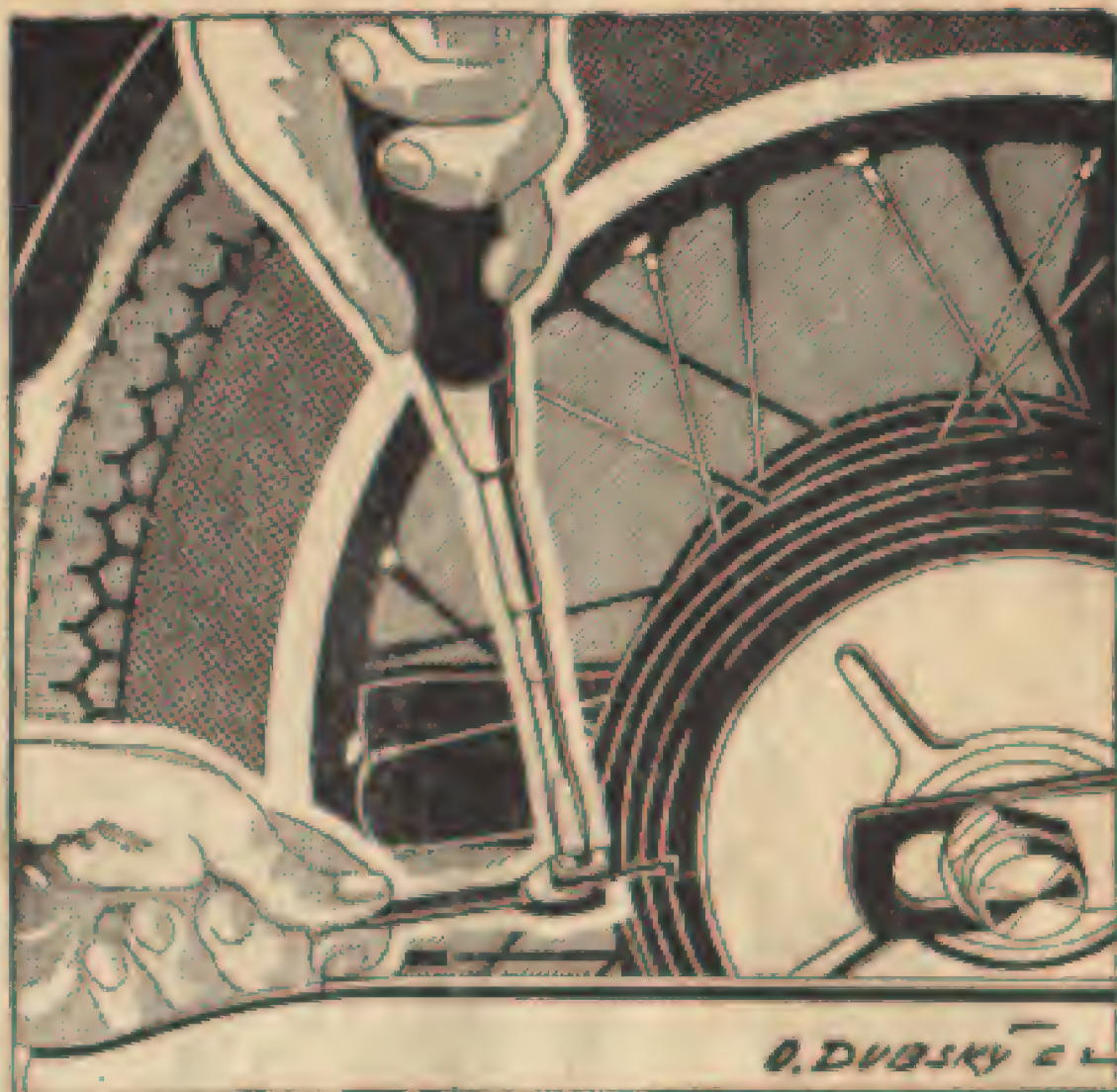


Fig. 35 - Dismantling the chaincase

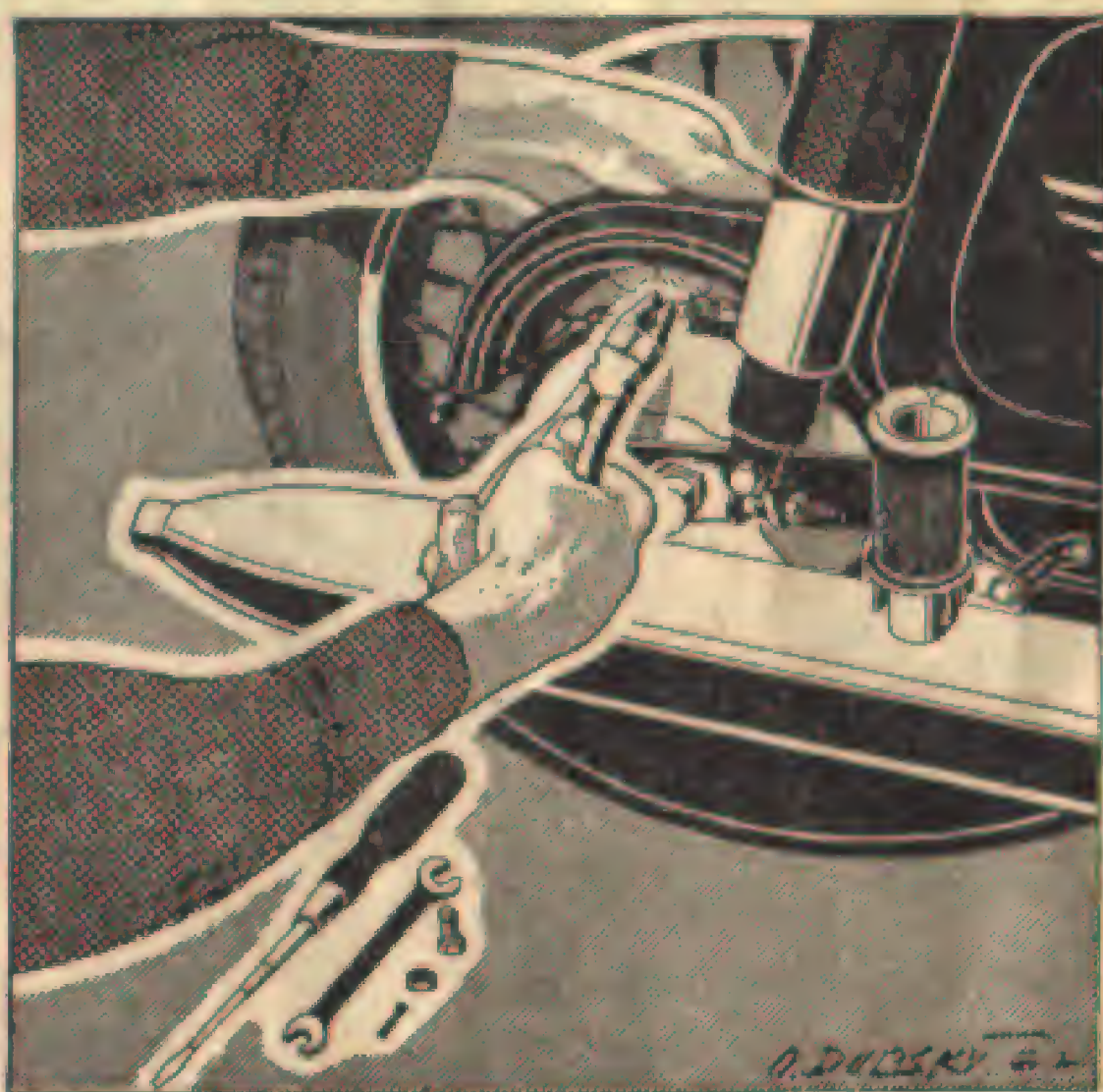


Fig. 36 - Removing the chain connecting link

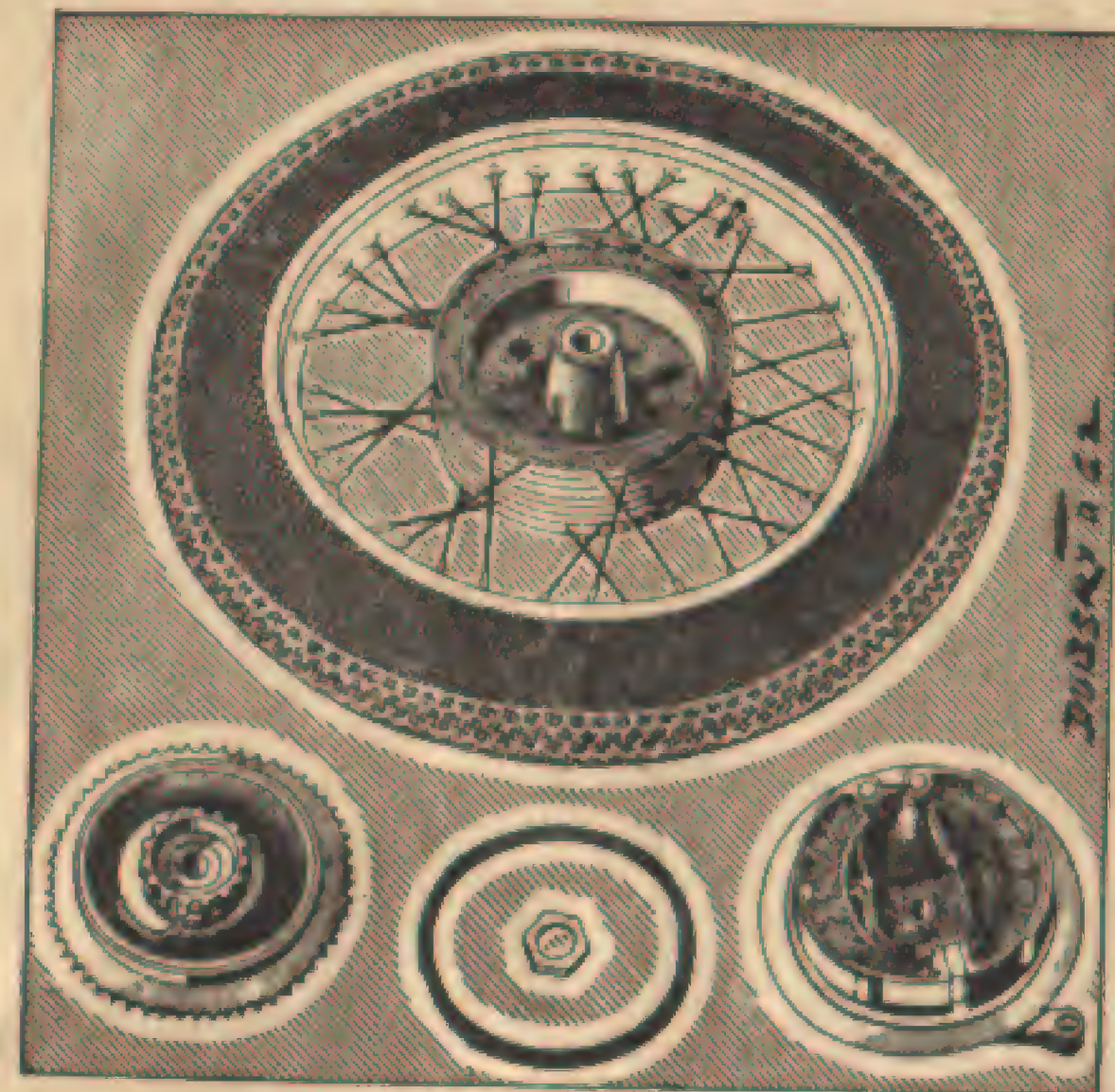


Fig. 37 - Rear chainwheel and brake drum - exploded view

### 3. REMOVING THE CHAINCASE AND THE CHAIN

To make the dismantling of the chaincase and the chain easier loosen both L. H. and R. H. chain adjusters, push the wheel forwards to release the chain and remove the wheel. Then remove the R. H. engine cover, disconnect the chaincase halves (Caution - First remove the split pin from the screw) and open the chaincase. Rotate the chain so that the chain connecting link reaches the rear chainwheel, release the clip and remove the connecting link using pliers or a screwdriver.

Pull out the chain and in turn take out the chaincase halves rearwards. When replacing the chain proceed as follows: pull the disconnected chain through the top chaincase half and place them together in position. Slip the chain in the gearbox sprocket so that the end of the chain reaches under the clutch cam. Pull the wire through the bottom chaincase half and connect the wire end with the chain. Then carefully pull the chain by means of the connected wire through the bottom chaincase half, placing it at the same time on the attachment of the chaincase. Be careful to fit both halves in the front side. Slip the chain on the chainwheel and connect the two chain ends with the connecting link and clip (Caution! - the open end of the clip should face the opposite direction of the chain rotation). Check whether the rubber seal of the chaincase is correctly replaced, fasten the halves of the chaincase together by means of the



bolt and secure with the split pin. Assemble the wheel and adjust the chain (see Part II, para 5).

When replacing the chain it is not necessary to dismantle the chaincase. Connect the new chain to the old one and with its help pull the new chain into its operational position.

#### 4. REMOVING THE REAR CHAINWHEEL

This operation can be carried out after the rear wheel and the chaincase have been removed. Slacken the chainwheel nut (spanner 32 mm) and remove the chainwheel together with its cover plate.

#### 5. REPLACING THE WHEEL BALL BEARINGS

Remove the brake drum plate with the brake shoes. Remove the seals from both sides of the wheel hub and on the side of the brake drum plate (when replacing the front wheel bearing, remove the plate) remove

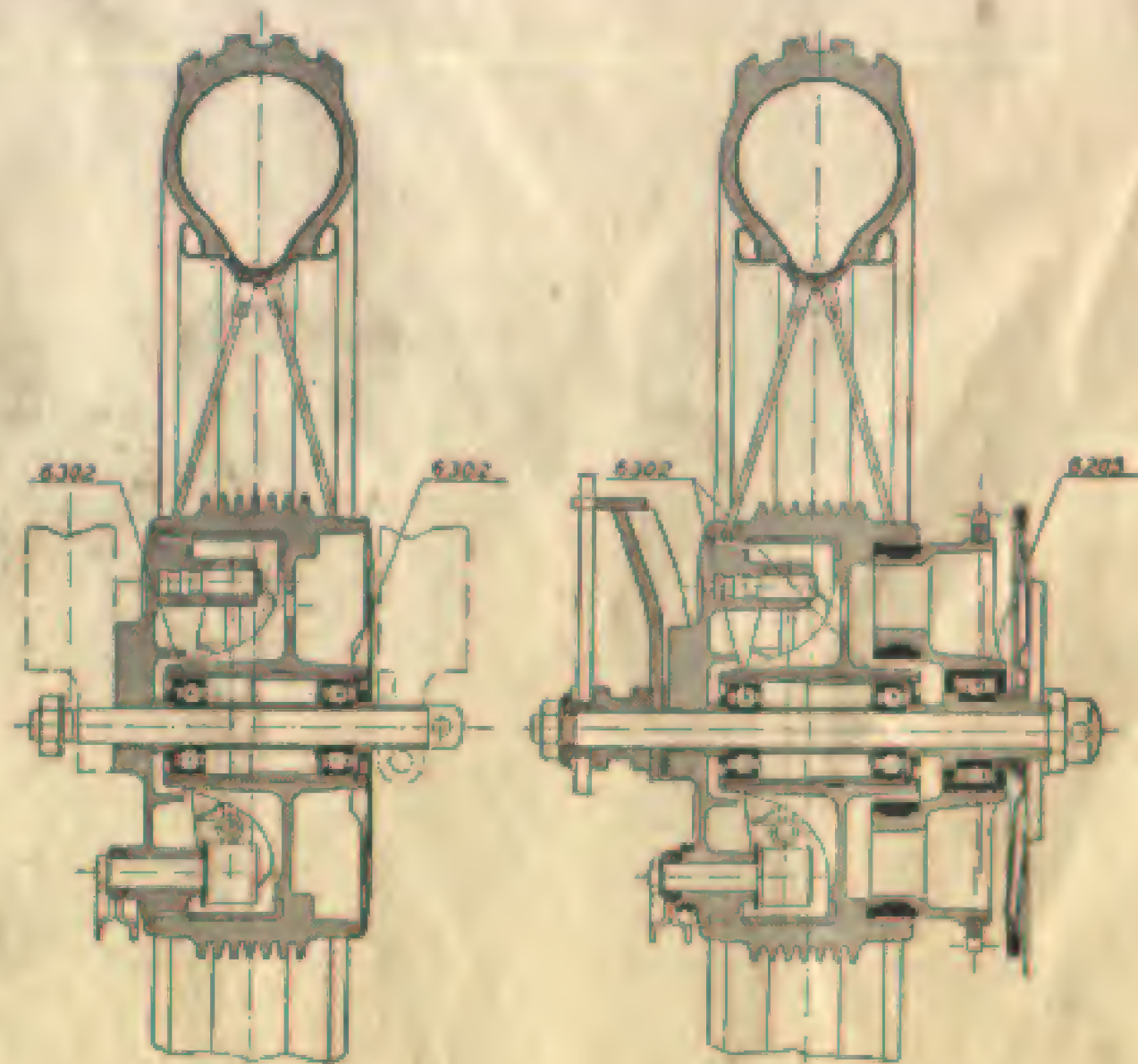


Fig. 38 - Front and rear wheel - sectional view

the bearing circlip. From the opposite side push the other bearing using a piece of tube until the unlocked bearings fall out. Push the remaining bearings out to the opposite side and remove the spacer.

Press in the new bearings by applying pressure to the outer bearing race, using a piece of tube. When replacing the rear chainwheel bearings proceed as follows: remove the plate and push out the spacer. Remove the seal and bearing circlip from the R. H. side of the chainwheel center. Push out the bearings using a piece of tube, from the splined driver side. Press on the new bearing using again preferably with a piece of tube of a diameter corresponding to the bearing outer race diameter.

#### 6. REMOVING THE CYLINDER HEAD AND BARREL

- a) 250 c. c. engine: Remove the dual seat, disconnect the fuel pipe and remove the fuel tank - see Part III, para 14 (be careful of the spring washer). Disconnect the sparking plug lead and remove the ignition coil. Disconnect the exhaust pipe (see Fig. 40), unscrew the four nuts holding the cylinder head to the cylinder barrel and remove

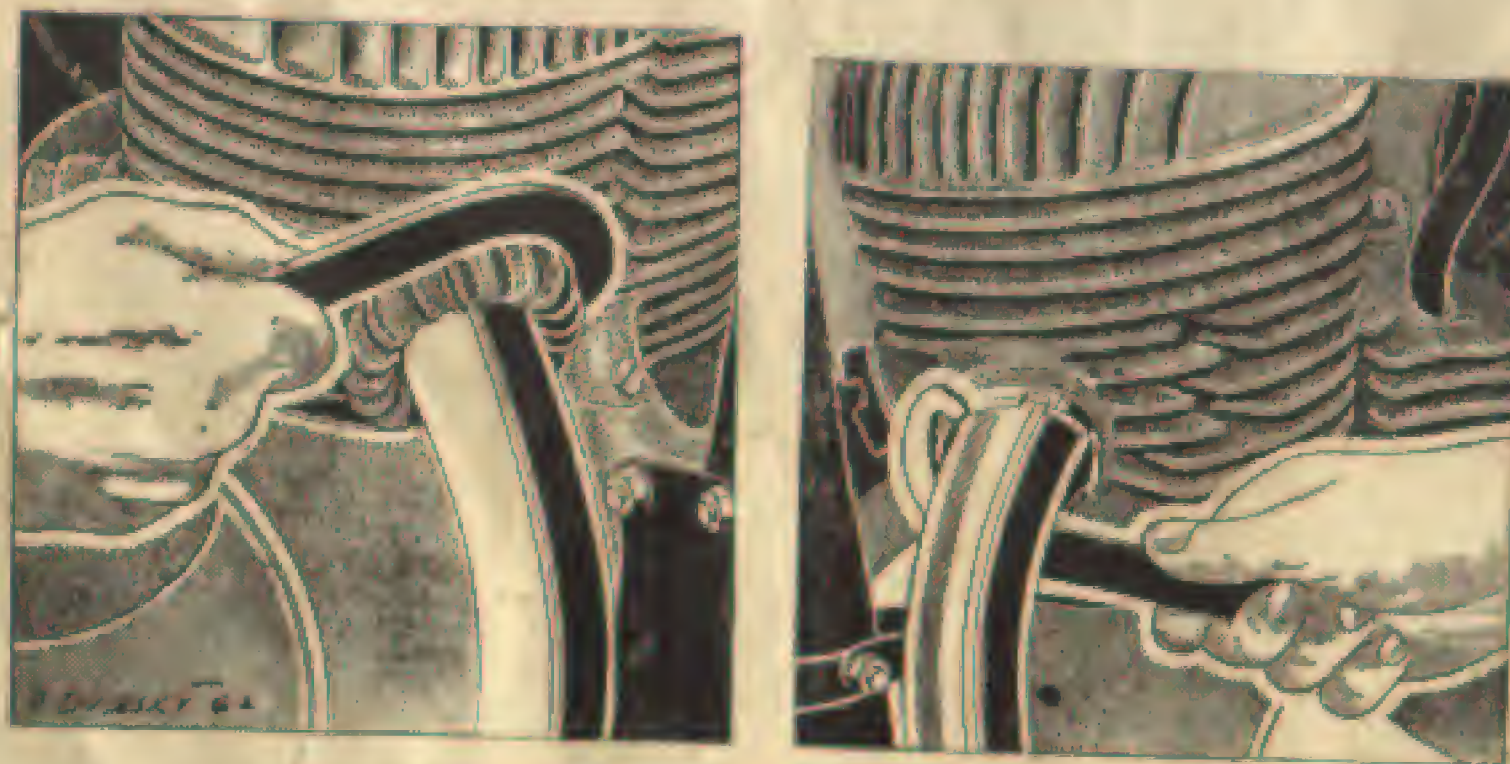


Fig. 39 - Disconnecting the exhaust pipe - 350 c. c.

Fig. 40 - Disconnecting the exhaust pipe - 250 c. c.



the cylinder head (see Fig. 41). Afterward remove the carburetter cover and both the throttle and choke valves. By means of nuts, unscrew the barrel securing studs (screw two nuts on to the stud, tighten them firmly together by two spanners - see Fig. 42 - and by unscrewing the bottom nut the stud can be unscrewed); bring the piston to the B. D. C. position and carefully push the cylinder barrel upwards - see Fig. 43 (be careful not to damage the cylinder barrel gasket). After removing the cylinder barrel disconnect the carburetter. Prevent dirt entering the crankcase opening (cover up the opening). Assemble in the reverse order. Note when fitting the cylinder barrel check whether the piston rings are correctly set in the locking pins. Before assembling drip oil into the piston ring grooves and smear the cylinder bore with oil. After fitting the cylinder barrel, push out the surplus oil by moving the piston to the T. D. C. position and drying it with a clean cloth.



Fig. 41 - Removing the cylinder head 250 c. c.

Fig. 42 - Unscrewing the studs - 250 c. c.

Fig. 43 - Removing the cylinder barrel - 250 c. c.

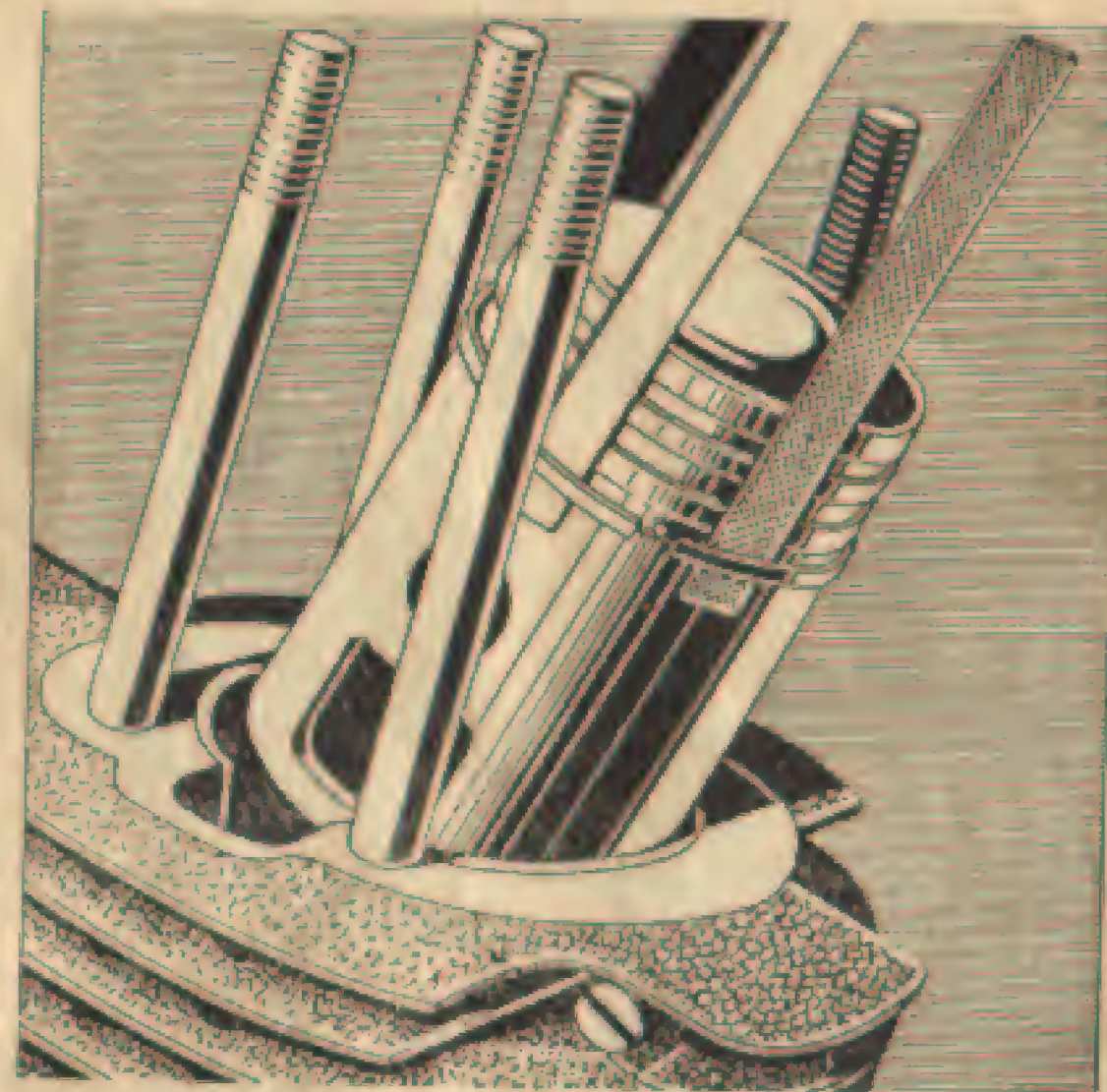
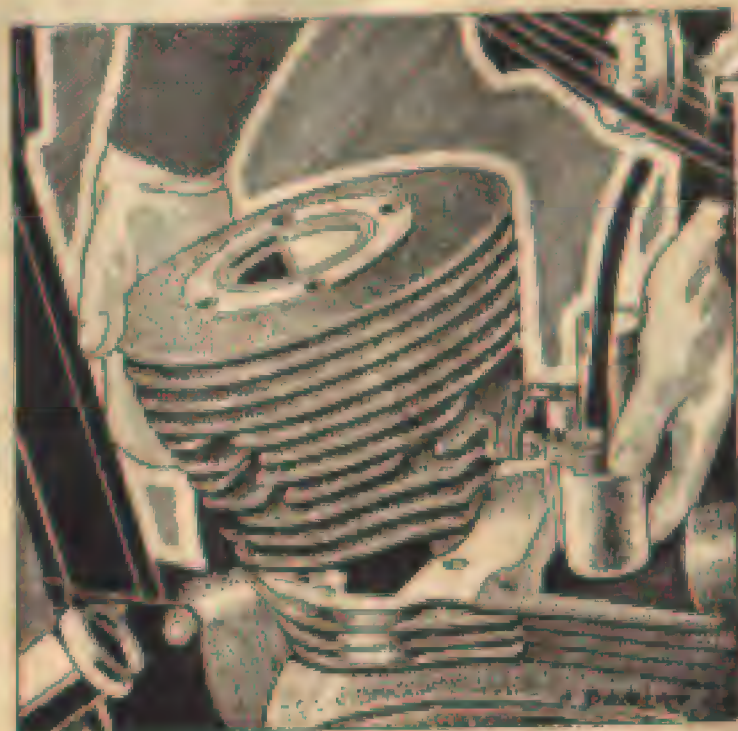


Fig. 44 - Fitting the piston rings

b) **350 c. c. engine:** Unscrew the two front screw fastening the fuel tank (on both R. H. and L. H. side of the steering head - use spanner 14 mm), disconnect the exhaust pipe (Fig. 39), sparking plug lead, unscrew the three nuts fastening the cylinder head to the cylinder barrel and remove the cylinder head. Bring the piston to the B. D. C. position, lift the front part of the fuel tank and remove carefully the cylinder barrel (take care not to damage the cylinder barrel gasket). Assemble in the reverse order and proceed in the same manner as at the model 250 c. c. Remove each cylinder barrel and cylinder head separately.

## 7. REPLACING THE PISTON RINGS

The piston rings have to be replaced if the gap exceeds 0.031 in. (0.8 mm). To check the gap width insert the removed piston ring into the cylinder barrel top part (approx. 0.39 in. - 10 mm deep) and control the gap between the ends of the piston ring which should be 0.008 in. (0.2 mm). The best way to remove the piston rings is to use three thin steel strips. Insert one strip under the piston ring in the middle and the two others under the piston ring ends (Fig. 44). To replace the piston rings proceed in the same manner.





Fig. 45 - Lubricating the steering head ball bearing

## 8. REMOVING THE CARBURETTER

- Disconnect the fuel pipe where it joints the fuel tank.
- Loosen the carburetter cover unscrewing the fastening nut off the throttle chamber.
- Remove the cover and slacken the throttle valve (on the 250 c. c. the choke valve too).
- Slacken the flange fastening nuts and push the carburetter out rearwards.
- When removing the carburetter, leave the induction silencer in its place and only disconnect the rubber sleeve.

## 9. DISMANTLING THE CLUTCH

After removing the L. H. engine cover, the clutch can be dismantled. Preferably use the double-ended spanner 10 mm to press in the cups which hold in the lock pins. Press in the cups one after another and remove the pins, washers and springs. The clutch has five plates with



Fig. 46 - Lubricating the steering head ball bearing

cork inserts and four metal plates (plus one pressure plate). When re-assembling, first insert the plate with cork inserts which seems to be in the best state. If the cork inserts are worn, replace them.

## 10. DISMANTLING THE HEADLAMP

The headlamp consists of three main parts: rim with parabolic reflector bottom and top nacelle.

Remove the rim with reflector after removing the securing screw M5 from the rim bottom and disconnecting the joint with leads.

Remove the top nacelle after releasing the catches inside the top nacelle unscrewing the screw on the rear side of the top nacelle (under the switch box) and unscrewing the speedometer drive union nut. If the top nacelle is removed completely, it is recommended to remove the battery fuse before disconnecting the switch box leads in order to prevent a short-circuit.

Remove the bottom nacelle after removing the handlebars (see para 12) disconnecting the electrical leads and clutch cable, unscrewing the steering head nuts (spanner 41 mm) and unscrewing the plug screws (spanner 32 mm). Now remove the fork head lug and the bottom nacelle can be pushed out.



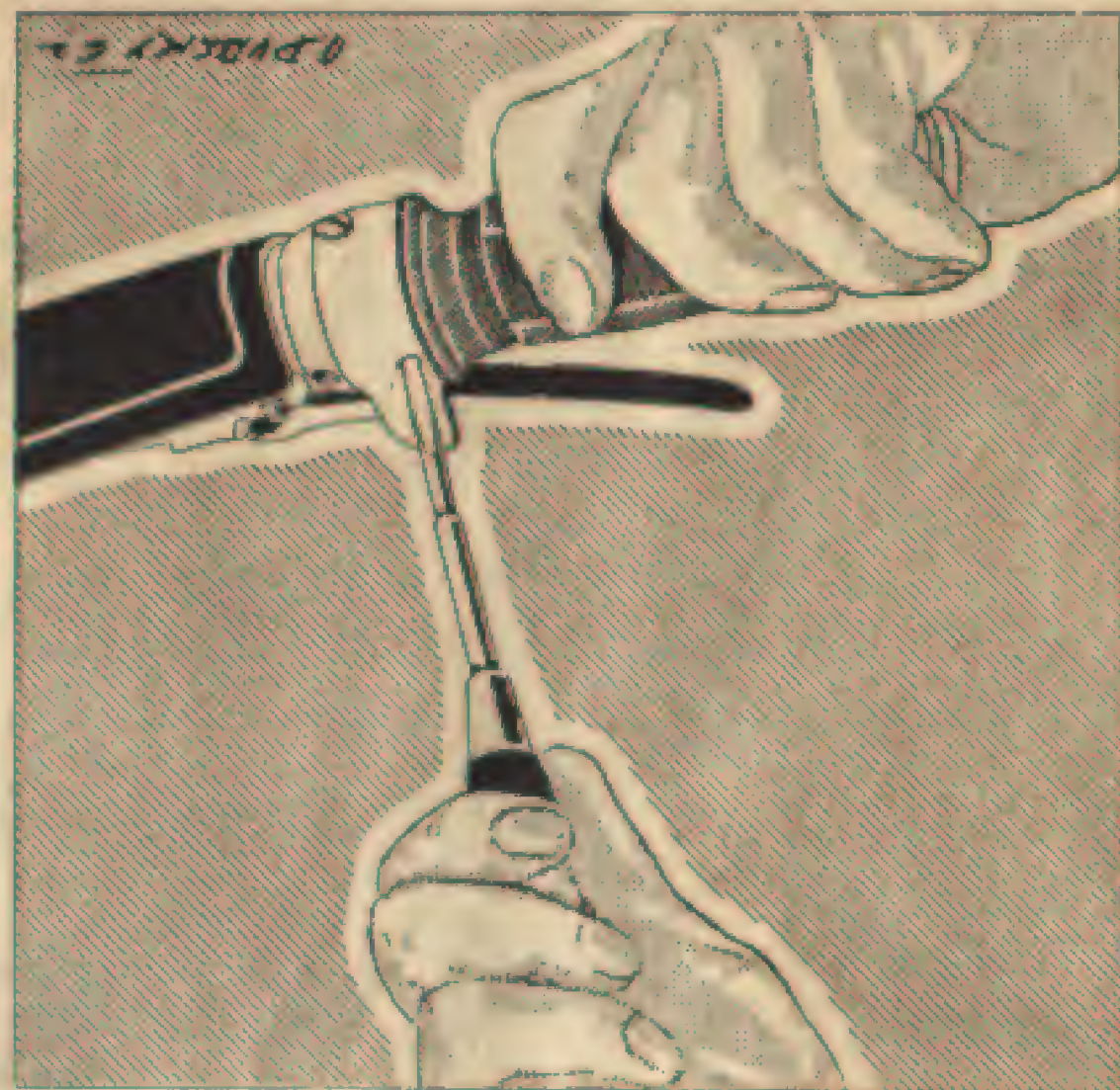


Fig. 47 - Adjusting the twist grip

## DISMANTLING THE STEERING HEAD AND FORK LEGS

First remove the top nacelle, handlebars, unscrew the nuts (spanners 41 and 32 mm) and release the fork head lug. Unscrew partly the nut holding the bearing cup (proceed carefully so as not to lose the bearing balls from the steering head cups). In this manner it is possible to lubricate the top bearing balls. Push the steering head column downwards and then the bottom bearing can be lubricated. When completely dismantling the fork, unscrew the nut fully, slacken and remove the nuts holding the bottom steering lug, push out one after the other the fork legs and the steering head, column (the front wheel and the mudguard are to be removed first before proceeding as above). When dismantling the front damper only (see Fig. 15) proceed as follows: Unscrew the nut (7), the screw (22) and push the slider (23) out of the tube. Using suitable pliers remove the circlip (17) and push out the damper. Grip the damper rod (18) in a vice with protective jaws and using combination pliers unscrew the end piece (19), remove the washer (25) and unscrew the nut (24). Tapping on the rod, drive out the centering end piece (26) and remove the rod with piston. Grip the rod in a vice and after unscrewing the nut (14) push out the piston (27). When reassembling a lip the pistone (27) and the washer (15) onto the stepped rod end and screw on the nut (14) which, when tightened fast, should be secured with a punch. Insert the rod with piston into the clean damper tube (16), taking care that the valve washer (27) is in the centre of the hole so as not to be damaged by the rod. Screw the nut (24) on to the other end of the rod and tighten it fast

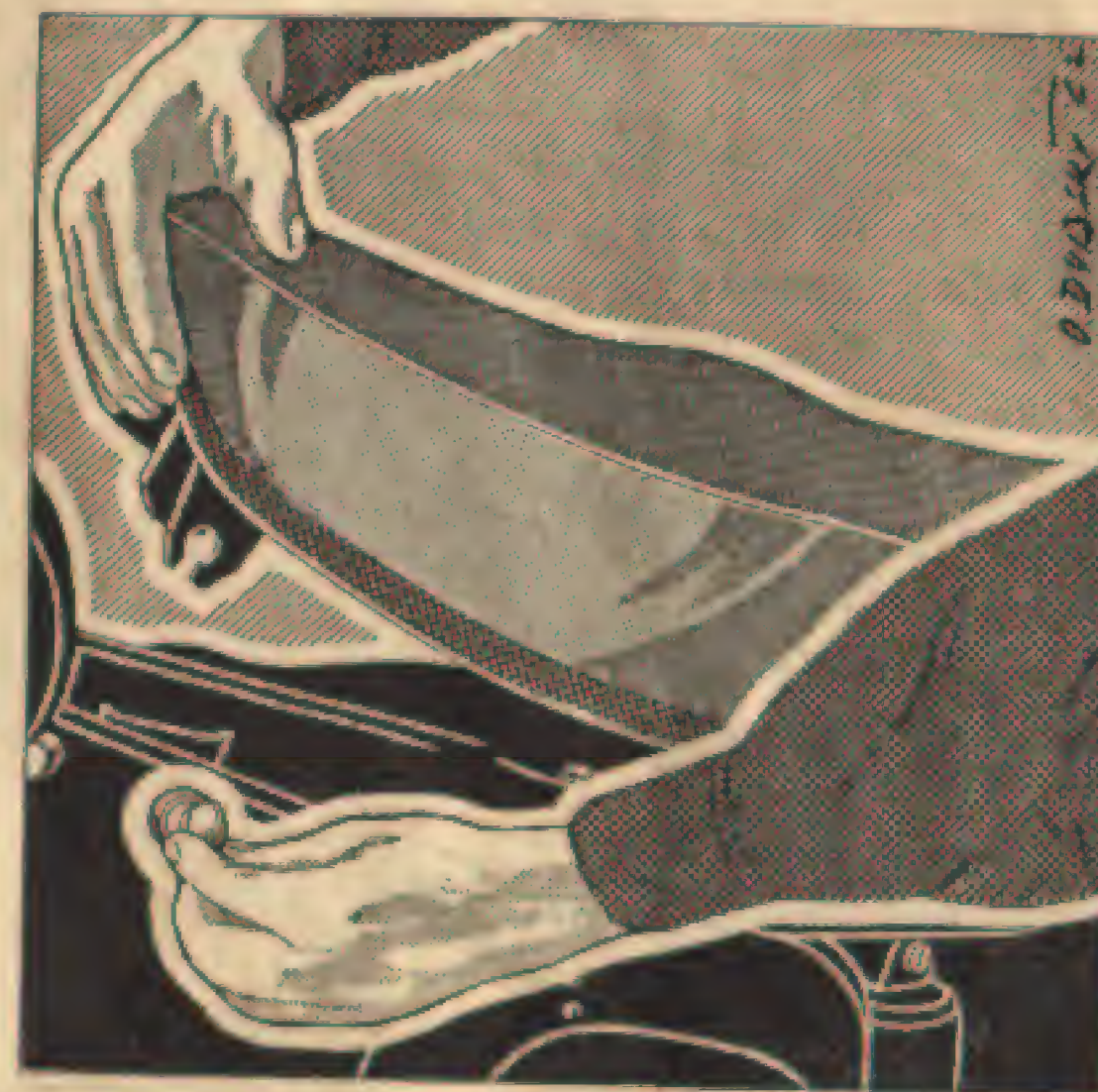


Fig. 48 - Removing the dual seat

until the thread comes through. Place the washer (25) on the thread an screw on the end-piece (19) tightening it fast with suitable pliers. Carefully drive the centering endpiece (26) into the damper tube, place the assembled damper into the tube (4) and secure with the circlip (17). Slide the clean slider (23) on to the tube with bushes and take hold of the end-piece (19) with the screw (22) with washer (21) and seal (20). Using the screw (22) turn the end-piece (19) **until the end-piece pin engages in the hole** and tighten the screw (22) fast. Grip the slider end-piece in a vice and screw on the nut (7), tightening in fast. Fit the spring (6) coated with grease and the cover (5) onto the top portion of the tube. Engage the assembled fork leg in the lugs and fill with damper oil (140 c. c.). Tighten fast the nut (2).

Note: When dismantling the damper itself the headlamp top nacelle need not be removed or the fork leg dismantled.

## 12. HANDLEBARS - TWIST GRIP

The handlebars are fastened by two clamps locked by four screws and two nuts M8. Four spring washers complete the set.

The handlebars can be removed after casing the headlamp rim with parabolic reflector after removing the top nacelle (see para 10) and slackening the clamp locking screws.

The twist grip can be pulled off after unscrewing the countersunk head screw through the opening in the rubber grip and plug. The twist grip rotation can be adjusted by the screw in the choke ring (Fig. 47).



### 13. REMOVING THE DUAL SEAT

Unlock the safety lock on the L. H. side (see Fig. 47), lift the front portion of the dual seat and by an up-and-forward movement revement the dual seat.

When reassembling take care to fit the rear catches correctly in the opening in the dual seat carrier.

### 14. REMOVING THE FUEL TANK

Disconnect the fuel pipe and unscrew two screws (spanner 14 mm) securing the front clamp ears and the through bolt with nut securing the rear clamp ears (spanner 14 mm). Do not forget to replace the three spring washers when reassembling.

### 15. REMOVING THE BOXES AND COWLS

The boxes and cowls are fixed by three screws to the frame of the motor-cycle. Before dismantling do not forget to disconnect the leads from the R. H. box, remove the stop switch and disconnect the spring ends. Unscrew the following parts from the R. H. side: nut (spanner 14 mm) and the through bolt securing the rear clamp ears of the rear portion of the fuel tank (be careful not to lose the spring washers), screw (spanner 10 mm) holding rear brake cable clamp and bolt (spanner 12 mm) near the pillion footrest.

From the L. H. side unscrew: the front footrest bolt (spanner 14 mm) and rear footrest bolt (spanner 12 mm). Then unscrew the remaining screws securing the cowls behind the engine and remove the cowls.

### 16. DISMANTLING THE REAR SUSPENSION AND CHANGING THE OIL

Having unscrewed two screws (spanner 12 mm) remove the suspension unit from its brackets in the frame and in the pivoted fork. The damper is designed so that no topping up with oil is required. It is, however, recommended to change the oil after covering 6,000 to 10,000 mile (10,000 to 15,000 km). It is also recommended to have any repairs, rinsing and oil changing (50 c. c.) carried out in a specialist workshop. Adjust the spring hardness after pressing the bottom spring cover by re-setting the circlip (a) to the second groove.

### 17. DISMANTLING REAR THE PIVOTED FORK

When removing the pivoted rear fork the following operations have to be carried out: remove the cowls (para 15), the suspension dampers (para 16), the rear wheel (para 2), chaincase (para 3), the rear chainwheel (para 4), the exhaust silencers and lubricating tube of the pivoted rear

fork. Afterwards unscrew the securing screw of the rear pivoted fork pin with the nut (spanner 17 mm) and the two nuts of the bolt (spanner 17 mm). Push the released bolt out to the R. H. side and remove the thrust washer. Pull out the pivoted fork pin to the R. H. side. It is recommended to have this repair carried out in a specialist repair shop, equipped with special tools.

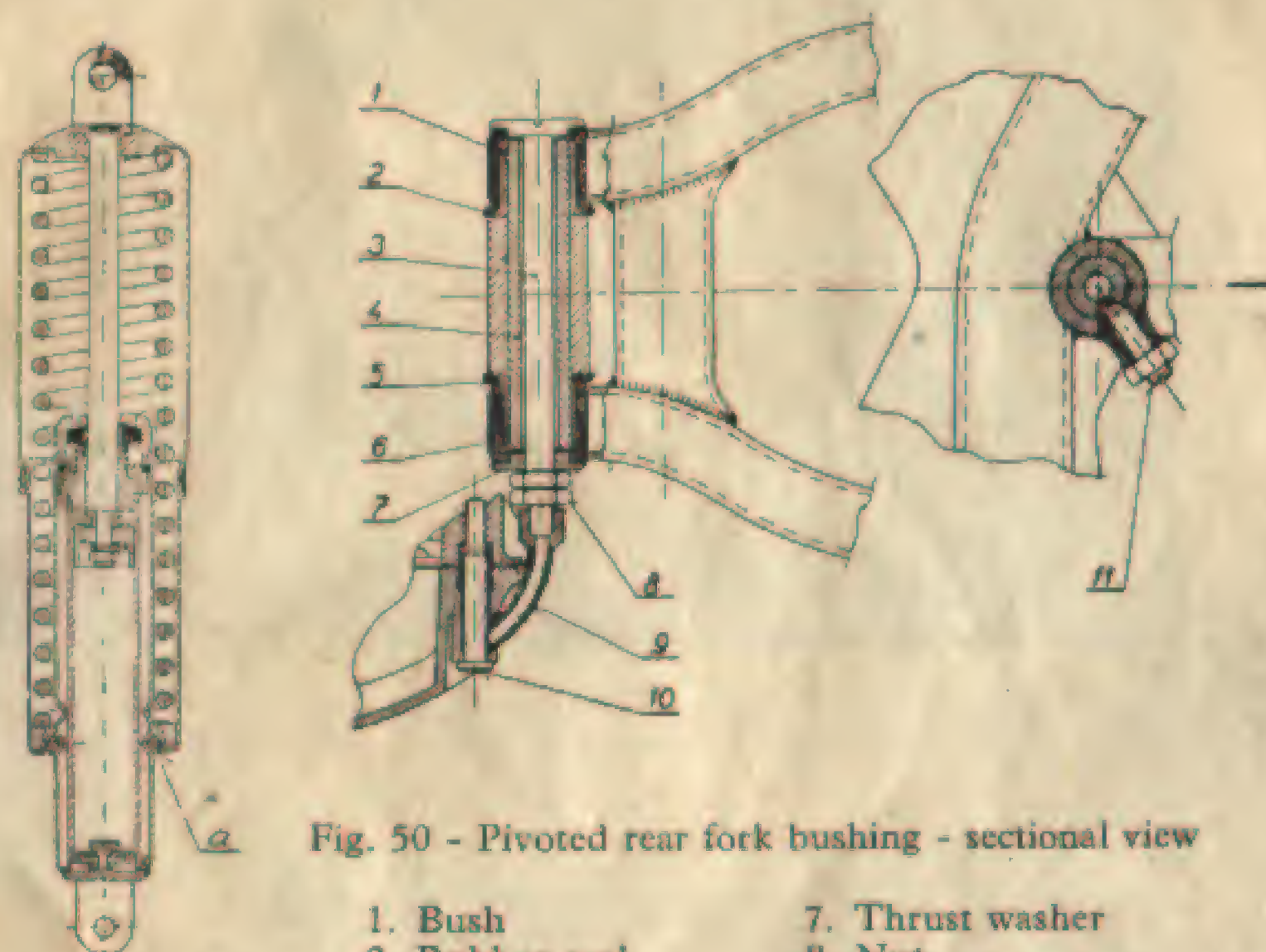


Fig. 49 - Rear suspension damper - sectional view

Fig. 50 - Pivoted rear fork bushing - sectional view

- |                      |                       |
|----------------------|-----------------------|
| 1. Bush              | 7. Thrust washer      |
| 2. Rubber seal       | 8. Nut                |
| 3. Bolt              | 9. Lubricating pipe   |
| 4. Pin               | 10. Engine cover bolt |
| 5. Cup               | 11. Locking bolt      |
| 6. Pivoted rear fork |                       |

### 18. REMOVING THE BATTERY

Open the L. H. box and remove the fuse case from its holder thus disconnecting one lead. Disconnect the other lead (earthing + pole) by unscrewing the nut M6 (spanner 10 mm) from the box. Pull down the securing strap and remove the battery.

### 19. DISMANTLING THE SWITCH BOX

Dismantle the switch box only if absolutely necessary. Lift the parabolic reflector and disconnect the speedometer flexible shaft. Free the headlamp top nacelle and then release the access to the switch box located in the top nacelle. It is recommended to remove the battery fuse before any manipulation with the switch box.



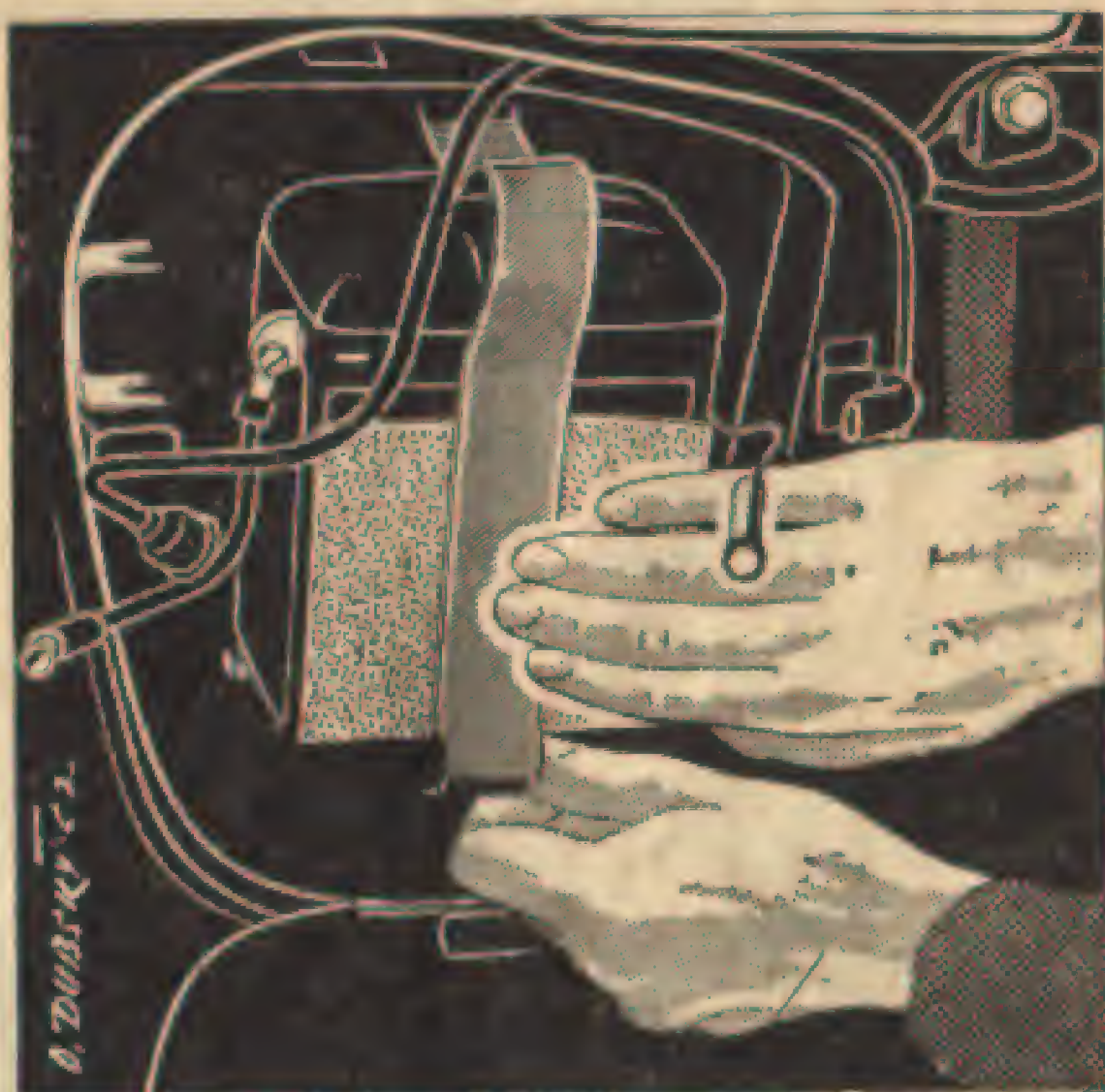


Fig. 51 - Removing the battery

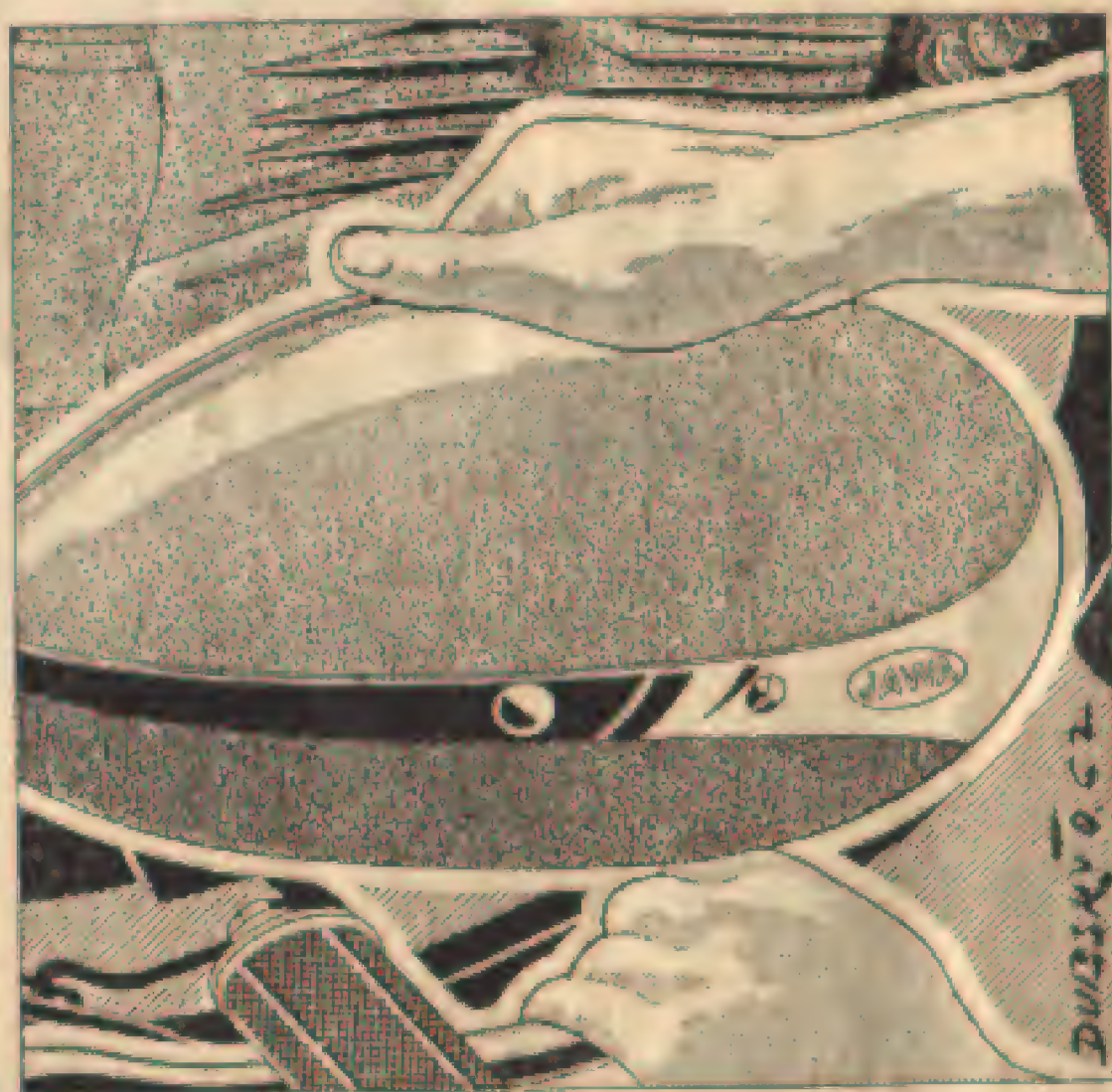


Fig. 52 - Removing the R. H. engine cover

## 20. REMOVING THE ENGINE FROM THE FRAME

Disconnect: 1. the fuel pipe, 2. the throttle cable (on the 250 c. c. the choke cable too), clutch cable (under the engine cover), 3. speedometer drive (the screw in the bottom portion of the L. H. half of the crankcase), 4. sparking plug and control "N" leads, 5. dynamo lead, 6. the rear pivoted fork lubricating pipe and 7. induction silencer rubber sleeve.

Remove: 1. the dual seat, 2. the chaincase and the chain, 3. the L. H. battery box, 4. the exhaust pipe, 5. the R. H. engine cover, 6. the clutch automatic holder, 7. the chaincase attachment, 8. the electrical leads from the R. H. crankcase. Having removed the L. H. box, the rear engine bolts are accessible: slacken the bolts (spanner 14 mm) and remove them. Then slacken and remove four front bolts (spanner 14 mm) fastening the engine to the frame and remove the engine to the L. H. side.

## 21. REMOVING THE R. H. AND L. H. ENGINE COVERS

Remove the R. H. engine cover when clutch adjustment (for thorough adjustment see Part II, para 6) or ignition setting is required. Unscrew the two screws and remove the cover (press the rear brake lever down to facilitate manipulation with the engine cover - see Fig. 52).

Before fitting the cover, clean the seating faces. Tighten the securing screws evenly and check the cover front part so that it seats properly (in order to prevent water leaking into the dynamo space).

Remove the L. H. cover when it is necessary to dismantle the clutch (to replace the clutch plates) or the primary chain or when replacing the speedometer drive at the engine.

Proceed as follows: 1. Drain the oil, 2. unscrew the five engine cover securing screws and turn the lubricating tube aside in order to prevent it hindering the removal of the cover, 3. release and turn down the footrest bracket, 4. remove the L. H. cover with the kickstarter lever (the lever in the gearshifting position - horizontally).

When reassembling the L. H. cover do not forget to check the paper gasket and two guide bushes. Tighten the screws properly proceeding in a crosswards direction in order to prevent the oil leaking. When removing the L. H. engine cover, special care must be taken not to damage the nylon pivoted fork pin lubricating pipe. If the nylon pipe is too hard, it is necessary to warm it a little (preferably to steam it) so as to soften it and make it more elastic.

### Note!

The right is reserved to effect modifications due to development in the illustrations or specifications of this manual.



## IV. DEFECTS, CAUSES AND REMEDIES

Symptoms of troubles	Location	Remedy
Lumpy running	Engine knocks	Engine overheated Wait until engine has cooled, do not run at high revolutions
		Plug points glow, faulty sparking plug Replace sparking plug Cylinder head clogged with carbon Remove cylinder head and decarbonise Over-advanced ignition Adjust correct gap by rotating the breaker base plate Exhaust silencer clogged Detach exhaust silencer and clean it
	Regular sparking	Water or oil in carburetter Clean the carburetter Insufficient fuel supply Open reserve supply tap, re-fuel, inspect inlet hose and filler cap breathing hole
		Temporary short circuiting caused by faulty plug lead Tape crack in insulation or replace lead Weak mixture Adjust carburetter Incorrectly mixed petrol Stir mixture properly before re-fuelling
Engine misfires	Irregular sparking	Unsuitable sparking plug Replace sparking plug Oiled sparking plug Remove and clean sparking plug Excessive spark gap Adjust correct spacing to 0.5—0.7 mm Dirty breaker points Clean the points using a cloth soaked in petrol Incorrectly adjusted breaker point Adjust the gap to 0.3 mm Temporary short circuiting caused by faulty plug lead Tape crack in insulation or replace lead

Symptoms of troubles	Location	Remedy
Engine will not fire or has stopped. Carburetter can be flooded.	Compression regular	Engine overheated Let the engine cool and keep it at low revolutions Insufficient lubrication See that the petrol is mixed properly at a ration 25 to 1
		Throttle cable broken Replace throttle cable Air leak between carburetter and cylinder Replace gasket
	Sparking regular	Jet choked Remove and clean the jet Leaking float Solder or replace the float Float stuck Release the float Float needle does not seal properly Repair or replace the needle
Lumpy running	Carburetter faulty	Insufficient fuel feed Remove and clean fuel pipe Incorrectly set ignition Adjust breaker point gap and ignition advance Incorrect carburetter setting (improper mixture) Adjust idling speed, needle position and clean air cleaner Exhaust silencer clogged Dismantle and decarbonise the exhaust silencer Worn cylinder interior and piston Rebore cylinder, replace piston and rings, have the gudgeon pin wearing checked (at specialized repair shop)
		Engine draws in false air (crankcase halves or carburetter stump are not tight) Take both crankcase apart, clean joint faces, apply jointing compound and reassemble properly. Replace carburetter stump gasket
	Temporary	Faulty ignition coil Replace the ignition coil Faulty condenser Replace the condenser
Engine lacks power	Permanent	Fuel pipe or cleaner partly clogged Clean fuel pipe or cleaner Throttle control cable sticks Lubricate or replace Faulty sparking plug Replace sparking plug Carbon accumulation in cylinder barrel, and head, exhaust passages and silencers Remove cylinder head and barrel, exhaust pipes (if required), and decarbonise



Symptoms of troubles				Location	Remedy		
Engine will not fire - Engine has stopped	Carburetter cannot be flooded				Empty fuel tank	Open fuel reserve and re-fuel at the earliest convenience	
					Fuel tap off	Turn fuel tap on	
					Fuel filter above the tap clogged	Unscrew the fuel tap and clean the filter	
	Irregular sparking	Spark at lead end				Chocked fuel pipe or screen in carburetter	Remove and blow the fuel pipe, remove and clean the carburetter
						Clogged filler cap breathing hole on the fuel tank	Clean filler cap breathing hole
						Oiled sparking plug	Remove and clean sparking plug
						Damaged plug insulation	Clean sparking plug or replace
		Red tell tale bulb off				Short circuiting between sparking plug points	Adjust sparking plug gap to 0.6—0.7 mm and clean it
						Plug points gap too wide	Adjust sparking gap to 0.6—0.7 mm
						Ignition key not inserted	Insert the key and turn into its respective position
No spark at lead end	Red controll tell tale bulb on				Blown battery fuse	Replace fuse	
					Dirty breaker points	Clean the points using a cloth soaked in petrol	
					Faulty breaker points	Repair or replace the points	
	Red controll tell tale bulb on				Plug lead broken or loosen	Tape insulation crack, replace lead at the earliest convenience	
					Damaged lead insulation	Tape lead in insulation and replace at the earliest convenience	
					Faulty condenser	Replace condenser	
					Water in contact breaker	Blow out water, wipe off carefully, allow to dry	
Regular sparking	Poor Compression				Faulty ignition coil	Replace ignition coil	
					Jammed piston ring	Remove, clean and re-assemble	
					The cylinder head loosened	Tighten the cylinder head	
					Damaged cylinder head gasket	Replace the cylinder head gasket	

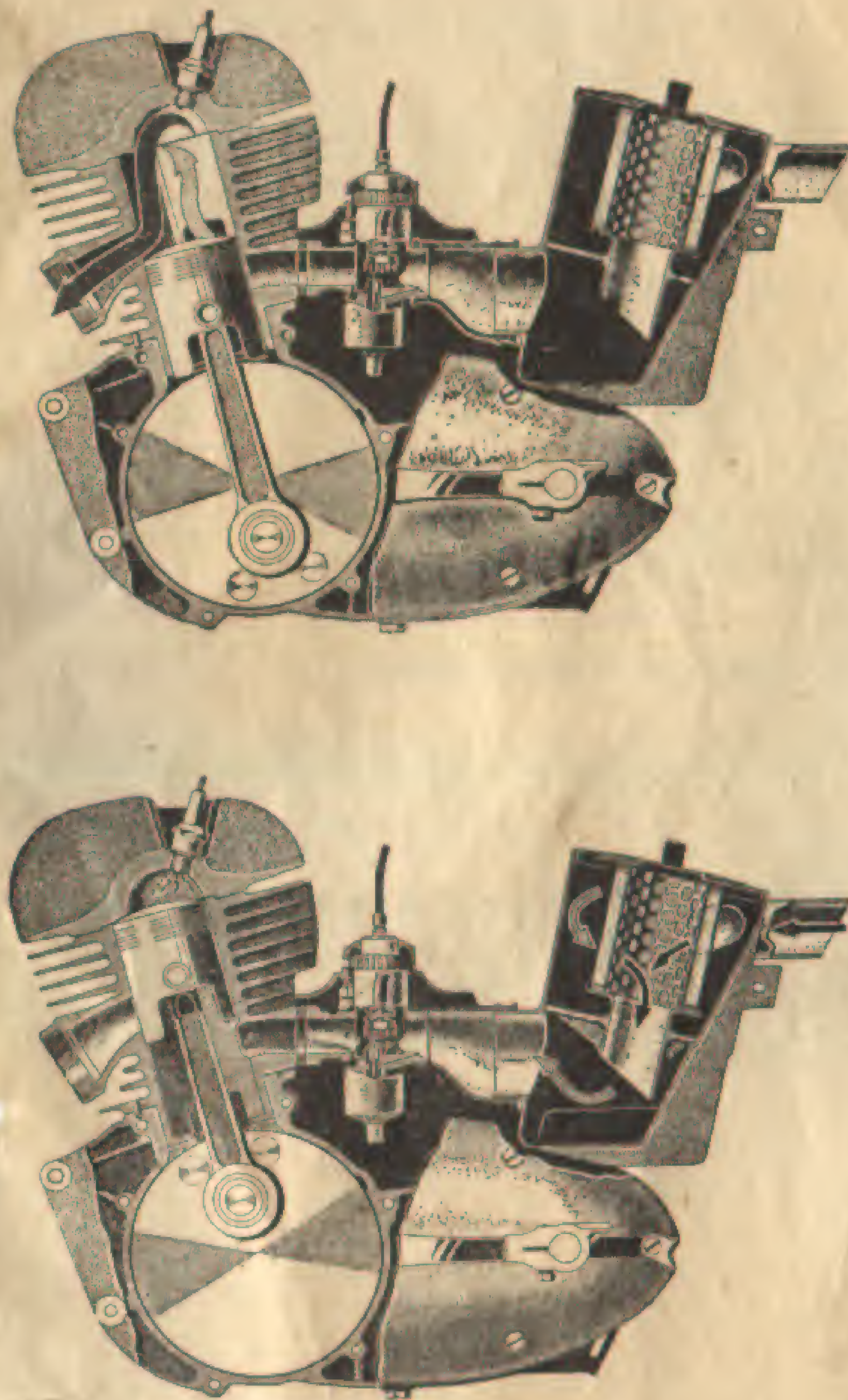


Fig. 53 - Two-stroke engine operation diagram



## V. TWO-STROKE ENGINE OPERATION

The two-stroke combustion engine is particularly suitable for motorcycles. Having few moving parts it is subjected to less wear and consequently is more reliable in operation. Its working action is effected in a single crankshaft revolution (i. e. two piston strokes).

### 1. Piston moves upwards:

The piston first closes the transfer ports, then the exhaust port and causes compression of the mixture in the compression space of the cylinder head. A few moments before the piston reaches its T. D. C. position, the compressed mixture is ignited by the electric spark from the sparking plug.

In the meantime a vacuum (underpressure) is created underneath the piston, causing induction of fresh mixture from the carburettor to the interior of the crankcase.

### 2. Piston moves downwards:

After ignition of the mixture the actual **working stroke** of the piston begins (transmitting the power of the expanding gases by means of the crankshaft mechanism and transmission to the motorcycle rear wheel). The top edge of the piston first opens the exhaust port and exhausting of the burnt gases occurs. The top edge and the piston lights then open the two transfer ports. Under the piston and in the interior of the crankcase is fresh mixture, compressed by the piston during its downward stroke. Through open transfer ports this fresh mixture will now flow **into the cylinder directed by the shape of the ports**: the two streams meet, reach the opposite cylinder wall, proceed towards the cylinder head which directs them to the exhaust ports side. The fresh mixture fills the cylinder, pressing at the same time the remaining burnt mixture out (scavenging).



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